which the maxi-\nmization of short-term self-interest yields outcomes\nleaving all participants worse off than feasible alterna-\ntives. In a public-good dilemma, for example, all those\nwho would benefit from the provision of a public\ngood\u2014such as pollution control, radio broadcasts or\nweather forecasting\u2014find it costly to contribute and\nwould prefer others to pay for the good instead. If\neveryone follows the equilibrium strategy, then the\ngood is not provided or is underprovided Yet, every-\none would be better off if everyone were to contribute.\n\nSocial dilemmas are found in all aspects of life,\nleading to momentous decisions affecting war and\npeace as well as the mundane relationships of keeping\npromises in everyday life.Social dilemmas are called by\nmany names, including the public-good or collective-\ngood problem(Olson 1965, P. Samuelson 1954),shirk-\ning(Alchian and Demsetz 1972), the free-rider prob-\nlem(Edney 1979,Grossman and Hart 1980),moral\nhazard(Holmstrom 1982),the credible commitment\ndilemma(Williams, Collins, and Lichbach 1997), gen-\neralized social exchange (Ekch 1974; Emerson 1972a,\n\nYet, the theory of collective action is the central\nsubject of political science It is the core of the justifi-\ncation for the state. Collective-action problems per-\nvade international relations, face legislators when de-\nvising public budgets, permeate public bureaucracies,\nand are at the core of explanations of voting, interest\ngroup formation,and citizen control of governments in\na democracy. If political scientists do not have an\nempirically grounded theory of collective actio n,then\n\nElinor Ostrom is Arthur F.Bentley Professor of Political Science;\nCo-Director, Workshop in Political Theory and Policy Analysis;and\nCo-Director,Center for the Study of Institut ions,Population,and\nEnvironmental Change; Indiana Universtiy,Bloomington,IN 47408-\n3895.\n\nThe author gratefully acknowledges the support of the National\nScience Foundation(Grant #SBR-9319835 and SBR-9521918),the\nFord Foundation,the Bradley Foundation, and the MacArthur\nFoundation. My heartiest thanks go to James Alt Jose Apesteguia,\nPatrick Brandt, Kathryn Firmin-Sellers, Roy Gardner,Derek Kau-\nneckis, Fabrice Lehoucq.Margaret Levi, Thomas Lyon, Tony Mate-\njczyk, Mike McGinnis, Trudi Miller, John Orbell, Vincent Ostrom,\nEric Rasmusen David Schmidt, Sujai Shivakumar, Vernon Smith,\nCatherine Tucker, Gcorge Varughese, Jimmy Walker, John Wl-\nliams, Rick Wilson, Toshio Yamagishi,and Xin Zhang for their\ncomments on carlier drafts and to Patty Dalecki for all her excellent\neditorial and moralsupport.\n The term \u201ctragedy of the commons" refers to the proble that\ncommon-pool resources, such as oceans, lakes, forests, irrigation\nsystems, and grazing ands can easily be overused or destroyed if\nproperty rights to these resources are not well defined (sce Hardin\n1968).\n\n1\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\tA Behavioral Approach to the Rational Choice Theory of Collective Action_ Presidential Address, American Political Science Association, 1997 on JSTOR __ Reader View\n\tpage 2\n\tpage 3\n\tpage 4\n\tpage 5\n\tpage 6\n\tpage 7\n\tpage 8\n\tpage 9\n\tpage 10\n\tpage 11\n\tpage 12\n\tpage 13\n\tpage 14\n\tpage 15\n\tpage 16\n\tpage 17\n\tpage 18\n\tpage 19\n\tpage 20\n\tpage 21\n\tpage 22\n\n", "extra": {"cited_message_idx": 11, "search_result_idx": null, "evidence_text": "source"}, "url": "file-zpqHfXOvQ1oVl3ljWEpbHwWJ"}}], "gizmo_id": "g-HTKibO4fm", "finish_details": {"type": "stop", "stop_tokens": [200002]}, "is_complete": true, "message_type": null, "model_slug": "gpt-4o", "default_model_slug": "gpt-4", "pad": "AAAAAAAAAAAAAAAAAAAAAAAAA", "parent_id": "837a3eca-db76-4616-8636-0dc49cbf300a", "request_id": "88e268aaffee0e55-MXP", "timestamp_": "absolute", "content_references": [{"matched_text": "\u301011\u2020source\u3011", "start_idx": 794, "end_idx": 805, "alt": null, "type": "file", "name": "Week 1_A behavioral approach to the rational

choice theory of collective action.pdf", "id": "file-zpqHfXOvQ1oVl3ljWEpbHwWJ", "source": "my_files", "snippet": "\nAmerican Political Science Review Vol. 92, No.1 March 1998\n\nA Behavioral Approach to the Rational Choice Theory of Collective Action\nPresidential Address, American Political Science Association, 1997\nELINOR OSTROM Indiana Universiy\n\n.Txtensive empirical evidence and theoretical developments i multiple disciplines stimulate a need to\nexpand the range of rational choice models to be used as a foundation for the study of social\ndilemmas and collective action. After an introduction to the problem of overcoming social dilemmas\n\nthrough collective ac t io ,th e remainder of this article is divided into six sections. The first briefly reviews the\ntheoretical predictions of curently accepted rational choice theory related to social dilemmas. The second\nsection summarizes the challenges to the sole reliance on a complete model of rationality presented by\nextensive erperimental research. In the third section, I discuss two major empirical findings that begin to\nshow how individuals achieve results that are "better than rational" by building conditions where reciprocity,\nreputation and trust can help to overcome the stong temptations of short-nun self-interest. The fourth\nsection raises the possibiliry of developing second-generation models of rationality, the fifth section develops\nan initial theoretical sc ea rio , and the final section concludes by examining the implications o f placing\nreciprocity reputation and trust at the core of an empirically tested, behavioral theory of collective action.\n\nwe are hand-waving at our central questions. I am\nafraid that we do a lot of hand-waving.\n\net me start with a provocative statement. You\nwould not be reading this article if it were not for\nsome of our ancestors learning how to undertake\n\ncollective action to solve social dilem mas. Successive\ngenerations have added to the stock of everyday knowl-\nedge about how to instill productive norms of behavior\nin their children and to craft rules to support collective\naction that produces public goods and avoids "trage-\ndies of the commons."I What our ancestors and con-\ntemporaries have learned about engaging in collective\naction for mutual defense,child rearing,and survival is\nnot , however, understood or explained by the extant\ntheory of collective action.\n\nThe lessons of effective collective action are not\nsimple\u2014as is obvious from human history and the\nimmense tragedies that humans have endured ,as well\nas the successes we have realized. As global relation-\nships become even more intricately intertwined and\ncomplex,however, our survival becomes more depen-\ndent on empirically grounded scientific understanding.\nWe have not yet developed a behavioral theory of\ncollective action based on models of the individual\nconsistent with empirical evidence about how individ-\nuals make decisions in social-dilemma situations. A\nbehavioralcommitment to theory grounded in empir-\nical inquiry is essential if we are to understand such\nbasic questions as why face-to-face communication so\nconsistently enhances cooperation in social dilemmas\nor how structural variables facilitate or impede cffec-\ntive collective action.\n\nSocial dilemmas occur whenever individuals in inter-\ndependent situations face choices in which the maxi-\nmization of short-term self-interest yields outcomes\nleaving all participants worse off than feasible alterna-\ntives. In a public-good dilemma, for example, all those\nwho would benefit from the provision of a public\ngood\u2014such as pollution control, radio broadcasts or\nweather forecasting\u2014find it costly to contribute and\nwould prefer others to pay for the good instead. If\neveryone follows the equilibrium strategy, then the\ngood is not provided or is underprovided Yet, every-\none would be better off if everyone were to contribute.\n\nSocial dilemmas are found in all aspects of

life,\nleading to momentous decisions affecting war and\npeace as well as the mundane relationships of keeping\npromises in everyday life.Social dilemmas are called by\nmany names, including the public-good or collective-\ngood problem(Olson 1965, P. Samuelson 1954),shirk-\ning(Alchian and Demsetz 1972), the free-rider prob-\nlem(Edney 1979,Grossman and Hart 1980),moral\nhazard(Holmstrom 1982),the credible commitment\ndilemma(Williams, Collins, and Lichbach 1997), gen-\neralized social exchange (Ekch 1974; Emerson 1972a,\n\nYet, the theory of collective action is the central\nsubject of political science It is the core of the justifi-\ncation for the state. Collective-action problems per-\nvade international relations, face legislators when de-\nvising public budgets, permeate public bureaucracies,\nand are at the core of explanations of voting, interest\ngroup formation,and citizen control of governments in\na democracy. If political scientists do not have an\nempirically grounded theory of collective actio n,then\n\nElinor Ostrom is Arthur F.Bentley Professor of Political Science;\nCo-Director, Workshop in Political Theory and Policy Analysis;and\nCo-Director,Center for the Study of Institut ions,Population,and\nEnvironmental Change; Indiana Universtiy,Bloomington,IN 47408-\n3895.\n\nThe author gratefully acknowledges the support of the National\nScience Foundation(Grant #SBR-9319835 and SBR-9521918),the\nFord Foundation,the Bradley Foundation, and the MacArthur\nFoundation. My heartiest thanks go to James Alt Jose Apesteguia,\nPatrick Brandt, Kathryn Firmin-Sellers, Roy Gardner,Derek Kau-\nneckis, Fabrice Lehoucq.Margaret Levi, Thomas Lyon, Tony Mate-\njczyk, Mike McGinnis, Trudi Miller, John Orbell, Vincent Ostrom,\nEric Rasmusen David Schmidt, Sujai Shivakumar, Vernon Smith,\nCatherine Tucker, Gcorge Varughese, Jimmy Walker, John Wl-\nliams, Rick Wilson, Toshio Yamagishi,and Xin Zhang for their\ncomments on carlier drafts and to Patty Dalecki for all her excellent\neditorial and moralsupport.\n The term \u201ctragedy of the commons" refers to the proble that\ncommon-pool resources, such as oceans, lakes, forests, irrigation\nsystems, and grazing ands can easily be overused or destroyed if\nproperty rights to these resources are not well defined (sce Hardin\n1968).\n\n1\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\tA Behavioral Approach to the Rational Choice Theory of Collective Action_ Presidential Address, American Political Science Association, 1997 on JSTOR __ Reader View\n\tpage 2\n\tpage 3\n\tpage 4\n\tpage 5\n\tpage 6\n\tpage 7\n\tpage 8\n\tpage 9\n\tpage 10\n\tpage 11\n\tpage 12\n\tpage 13\n\tpage 14\n\tpage 15\n\tpage 16\n\tpage 17\n\tpage 18\n\tpage 19\n\tpage 20\n\tpage 21\n\tpage 22\n\n", "cloud_doc_url": null}, {"matched_text": "\u301010\u2020source\u3011", "start_idx": 1012, "end_idx": 1023, "alt": null, "type": "file", "name": "SRM DQ4.docx", "id": "file-jrIPCdBup7OEovvS9tDvhMTh", "source": "my_files", "snippet": "Part 1: What are the three dimensions of improvement in Life Cycle Sustainability Assessment suggested in the reading? Describe why these are important and relate and apply the three dimensions to your learning from earlier modules.According to Onat et al. (2017) three key dimensions of improvement are suggested to enhance the effectiveness of sustainability assessments. These dimensions include the integration of environmental economic and social dimensions the application of systems thinking and the active engagement of stakeholders. Each of these elements is vital for constructing a holistic and effective approach to sustainability that transcends the limitations often imposed by capitalist systems which typically prioritize profit at the expense of environmental and social equity.\nThe overall approach to sustainability presented by Onat et al. (2017) emphasizes the necessity of considering the environmental economic and social impacts of products or services throughout their lifecycle. It

stands in contrast to and challenges the capitalist tendency to focus solely on economic gains by highlighting the interconnectedness of these dimensions. Ignoring any of these aspects can lead to solutions that might appear beneficial in one area but are detrimental in others.Systems thinking requires understanding the complete lifecycle of a product or service\u2014from raw material extraction to disposal\u2014and identifying potential impacts at each stage. This method helps in pinpointing critical points for intervention and prevents unintended consequences that could arise from changes made in isolation. One can clearly see the links between systems thinking and the ideas presented by Ostrum (1997) which expands the rational choice models to incorporate collective actions that better address complex social dilemmas. It challenges simplistic linear thinking\u2014common in capitalist approaches\u2014that often overlook long-term consequences for immediate profit.\nFinally engaging stakeholders across the lifecycle of a product or service ensures that the diverse values and needs of different groups are considered and addressed in the sustainability assessment process. This approach is crucial for democratizing decision-making processes which often are controlled top-down in capitalist structures. Fisher\u2019s (2020) discussions on how system dynamics modeling can involve stakeholders in understanding and managing complex systems effectively provide a solid argument for stakeholder engagement across the lifecycle. \nBy applying these three dimensions to the broader discussions from earlier modules it becomes evident how these principles can help counteract the equity and sustainability challenges exacerbated by capitalist systems. These dimensions advocate for a more inclusive holistic and long-term approach to sustainability that aligns with social equity and environmental stewardship rather than focusing narrowly on immediate economic outcomes. This integrated approach not only critiques but actively challenges the inequities perpetuated by capitalist systems paving the way for more sustainable and equitable global practices.\n\nPart 2: What indicators are required to assess the systems dynamics of flow-limited resources? \nTo effectively assess the dynamics of flow-limited resources within a system a systems dynamics model must incorporate several key indicators. These indicators include stocks flows converters/constants and information flows each playing a crucial role in understanding and predicting system behaviors.\nStocks represent the quantities of resources available within the system at any given time. These could be tangible elements like water in a reservoir or abstract quantities such as carbon or even a population count in an ecological study. Stocks are foundational for monitoring resource levels and serve as a baseline for measuring changes over time (Reuter 2013)\nFlows describe the movement of resources between stocks or from external sources into the system. This includes inputs and outputs measured over specific time intervals such as liters of water per hour or tons of carbon per year. Understanding flows is critical for assessing how resources are utilized and replenished within the system providing insights into sustainability and efficiency (Reuter 2013).\nConverters/constants are parameters within the model that affect flows or stocks but remain unchanged regardless of system dynamics. These could include growth rate constants conversion efficiencies or fixed loss rates which are essential for stabilizing the model and making accurate predictions (Reuter 2013).\nInformation flows represent the non-material connections that influence system components by altering flows or converters based on the state of stocks or other variables. This aspect of systems dynamics is crucial for modeling feedback mechanisms and adaptive behaviors within the system allowing for a more nuanced understanding of how changes

in one part of the system can ripple through to others (Reuter 2013).\nBy integrating these components into a systems dynamics model it is possible to construct a comprehensive view of how resources are interlinked and governed by various dynamic factors. This holistic approach is vital for predicting future system states under different scenarios and for making informed decisions about resource management and conservation.\nWhat inputs might be incorporated into a model of flow-limited resources? How is this different from stock-limited resources? In resource management two distinct modeling approaches are used to predict and understand resource availability and sustainability: flow-limited and stock-limited models.\nFlow-limited models focus on the dynamics of resource renewal and consumption. These models consider key inputs like the rate at which a resource regenerates whether naturally or through human efforts. They also analyze the consumption rate to see how quickly the resource is being used by various entities or processes. Additionally factors like environmental conditions regulatory policies and technological changes play significant roles in influencing resource availability and flow. This model is dynamic adapting to changes in usage patterns and replenishment strategies providing a flexible framework for forecasting future resource statuses (Reuter 2013).\nIn contrast stock-limited models are concerned with the finite quantities of resources available. They focus on the absolute amount of the resource that exists or can be accessed such as fossil fuels or minerals. These models consider extraction or harvest rates detailing how quickly the resource is depleted over time. They also evaluate the resource\u2019s regeneration capabilities whether it can be naturally replenished or artificially sustained over long periods. This approach emphasizes the depletion of a fixed stock highlighting the limits of availability and the critical need for conservation and efficient use (Reuter 2013).\nThe main difference between these two models lies in their focus and application. Flow-limited models are dynamic reflecting continuous changes in resource flows and the effects of various influencing factors. They are particularly useful when resources can be renewed or are affected by external conditions. On the other hand stock-limited models deal with resources that have fixed availability concentrating on managing finite supplies and preventing exhaustion. Understanding these differences is crucial for policymakers businesses and conservationists. It helps in developing effective strategies for resource management ensuring sustainability and tackling the challenges posed by limited natural resources (Fisher 2020).\nProvide an example of the systems dynamics of:\nA stock-limited resource (such as cobalt)\nA flow-limited resource (such as rabbits)\nDescribe what and how you would measure the inputs outputs and feedback loops (in-flow out-flow connectors or dependencies stocks and sources or sinks) in each example. Keep it simple (i.e. bamboo production for chairs). You don\u2019t have to do the mathematical calculations just describe the systems process. (If you want to take it further you can use Stella Online Modeling linked above).", "cloud_doc_url": null}, {"matched_text": "\u301011\u2020source\u3011", "start_idx": 1468, "end_idx": 1479, "alt": null, "type": "file", "name": "Week 1_A behavioral approach to the rational choice theory of collective action.pdf", "id": "file-zpqHfXOvQ1oVl3ljWEpbHwWJ", "source": "my_files", "snippet": "\nAmerican Political Science Review Vol. 92, No.1 March 1998\n\nA Behavioral Approach to the Rational Choice Theory of Collective Action\nPresidential Address, American Political Science Association, 1997\nELINOR OSTROM Indiana Universiy\n\n.Txtensive empirical evidence and theoretical developments i multiple disciplines stimulate a need to\nexpand the range of rational choice models to be used as a foundation for the study of social\ndilemmas and

collective action. After an introduction to the problem of overcoming social dilemmas\n\nthrough collective ac t io ,th e remainder of this article is divided into six sections. The first briefly reviews the\ntheoretical predictions of curently accepted rational choice theory related to social dilemmas. The second\nsection summarizes the challenges to the sole reliance on a complete model of rationality presented by\nextensive erperimental research. In the third section, I discuss two major empirical findings that begin to\nshow how individuals achieve results that are "better than rational" by building conditions where reciprocity,\nreputation and trust can help to overcome the stong temptations of short-nun self-interest. The fourth\nsection raises the possibiliry of developing second-generation models of rationality, the fifth section develops\nan initial theoretical sc ea rio , and the final section concludes by examining the implications o f placing\nreciprocity reputation and trust at the core of an empirically tested, behavioral theory of collective action.\n\nwe are hand-waving at our central questions. I am\nafraid that we do a lot of hand-waving.\n\net me start with a provocative statement. You\nwould not be reading this article if it were not for\nsome of our ancestors learning how to undertake\n\ncollective action to solve social dilem mas. Successive\ngenerations have added to the stock of everyday knowl-\nedge about how to instill productive norms of behavior\nin their children and to craft rules to support collective\naction that produces public goods and avoids "trage-\ndies of the commons."I What our ancestors and con-\ntemporaries have learned about engaging in collective\naction for mutual defense,child rearing,and survival is\nnot , however, understood or explained by the extant\ntheory of collective action.\n\nThe lessons of effective collective action are not\nsimple\u2014as is obvious from human history and the\nimmense tragedies that humans have endured ,as well\nas the successes we have realized. As global relation-\nships become even more intricately intertwined and\ncomplex,however, our survival becomes more depen-\ndent on empirically grounded scientific understanding.\nWe have not yet developed a behavioral theory of\ncollective action based on models of the individual\nconsistent with empirical evidence about how individ-\nuals make decisions in social-dilemma situations. A\nbehavioralcommitment to theory grounded in empir-\nical inquiry is essential if we are to understand such\nbasic questions as why face-to-face communication so\nconsistently enhances cooperation in social dilemmas\nor how structural variables facilitate or impede cffec-\ntive collective action.\n\nSocial dilemmas occur whenever individuals in inter-\ndependent situations face choices in which the maxi-\nmization of short-term self-interest yields outcomes\nleaving all participants worse off than feasible alterna-\ntives. In a public-good dilemma, for example, all those\nwho would benefit from the provision of a public\ngood\u2014such as pollution control, radio broadcasts or\nweather forecasting\u2014find it costly to contribute and\nwould prefer others to pay for the good instead. If\neveryone follows the equilibrium strategy, then the\ngood is not provided or is underprovided Yet, every-\none would be better off if everyone were to contribute.\n\nSocial dilemmas are found in all aspects of life,\nleading to momentous decisions affecting war and\npeace as well as the mundane relationships of keeping\npromises in everyday life.Social dilemmas are called by\nmany names, including the public-good or collective-\ngood problem(Olson 1965, P. Samuelson 1954),shirk-\ning(Alchian and Demsetz 1972), the free-rider prob-\nlem(Edney 1979,Grossman and Hart 1980),moral\nhazard(Holmstrom 1982),the credible commitment\ndilemma(Williams, Collins, and Lichbach 1997), gen-\neralized social exchange (Ekch 1974; Emerson 1972a,\n\nYet, the theory of collective action is the

central\nsubject of political science It is the core of the justifi-\ncation for the state. Collective-action problems per-\nvade international relations, face legislators when de-\nvising public budgets, permeate public bureaucracies,\nand are at the core of explanations of voting, interest\ngroup formation,and citizen control of governments in\na democracy. If political scientists do not have an\nempirically grounded theory of collective actio n,then\n\nElinor Ostrom is Arthur F.Bentley Professor of Political Science;\nCo-Director, Workshop in Political Theory and Policy Analysis;and\nCo-Director,Center for the Study of Institut ions,Population,and\nEnvironmental Change; Indiana Universtiy,Bloomington,IN 47408-\n3895.\n\nThe author gratefully acknowledges the support of the National\nScience Foundation(Grant #SBR-9319835 and SBR-9521918),the\nFord Foundation,the Bradley Foundation, and the MacArthur\nFoundation. My heartiest thanks go to James Alt Jose Apesteguia,\nPatrick Brandt, Kathryn Firmin-Sellers, Roy Gardner,Derek Kau-\nneckis, Fabrice Lehoucq.Margaret Levi, Thomas Lyon, Tony Mate-\njczyk, Mike McGinnis, Trudi Miller, John Orbell, Vincent Ostrom,\nEric Rasmusen David Schmidt, Sujai Shivakumar, Vernon Smith,\nCatherine Tucker, Gcorge Varughese, Jimmy Walker, John Wl-\nliams, Rick Wilson, Toshio Yamagishi,and Xin Zhang for their\ncomments on carlier drafts and to Patty Dalecki for all her excellent\neditorial and moralsupport.\n The term \u201ctragedy of the commons" refers to the proble that\ncommon-pool resources, such as oceans, lakes, forests, irrigation\nsystems, and grazing ands can easily be overused or destroyed if\nproperty rights to these resources are not well defined (sce Hardin\n1968).\n\n1\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\tA Behavioral Approach to the Rational Choice Theory of Collective Action_ Presidential Address, American Political Science Association, 1997 on JSTOR __ Reader View\n\tpage 2\n\tpage 3\n\tpage 4\n\tpage 5\n\tpage 6\n\tpage 7\n\tpage 8\n\tpage 9\n\tpage 10\n\tpage 11\n\tpage 12\n\tpage 13\n\tpage 14\n\tpage 15\n\tpage 16\n\tpage 17\n\tpage 18\n\tpage 19\n\tpage 20\n\tpage 21\n\tpage 22\n\n",
"cloud_doc_url": null}, {"matched_text": "\u301011\u2020source\u3011", "start_idx": 1599, "end_idx": 1610, "alt": null, "type": "file", "name": "Week 1_A behavioral approach to the rational choice theory of collective action.pdf", "id": "file-zpqHfXOvQ1oVl3ljWEpbHwWJ", "source": "my_files", "snippet": "\nAmerican Political Science Review Vol. 92, No.1   March 1998\n\nA Behavioral Approach to the Rational Choice Theory of Collective Action\nPresidential Address, American Political Science Association, 1997\nELINOR OSTROM Indiana Universiy\n\n.Txtensive empirical evidence and theoretical developments i multiple disciplines stimulate a need to\nexpand the range of rational choice models to be used as a foundation for the study of social\ndilemmas and collective action. After an introduction to the problem of overcoming social dilemmas\n\nthrough collective ac t io ,th e remainder of this article is divided into six sections. The first briefly reviews the\ntheoretical predictions of curently accepted rational choice theory related to social dilemmas. The second\nsection summarizes the challenges to the sole reliance on a complete model of rationality presented by\nextensive erperimental research. In the third section, I discuss two major empirical findings that begin to\nshow how individuals achieve results that are "better than rational" by building conditions where reciprocity,\nreputation and trust can help to overcome the stong temptations of short-nun self-interest. The fourth\nsection raises the possibiliry of developing second-generation models of rationality, the fifth section develops\nan initial theoretical sc ea rio , and the final section concludes by examining the implications o f placing\nreciprocity reputation and trust at the core of an empirically tested,

behavioral theory of collective action.\n\nwe are hand-waving at our central questions. I am\nafraid that we do a lot of hand-waving.\n\net me start with a provocative statement. You\nwould not be reading this article if it were not for\nsome of our ancestors learning how to undertake\n\ncollective action to solve social dilem mas. Successive\ngenerations have added to the stock of everyday knowl-\nedge about how to instill productive norms of behavior\nin their children and to craft rules to support collective\naction that produces public goods and avoids "trage-\ndies of the commons."I What our ancestors and con-\ntemporaries have learned about engaging in collective\naction for mutual defense,child rearing,and survival is\nnot , however, understood or explained by the extant\ntheory of collective action.\n\nThe lessons of effective collective action are not\nsimple\u2014as is obvious from human history and the\nimmense tragedies that humans have endured ,as well\nas the successes we have realized. As global relation-\nships become even more intricately intertwined and\ncomplex,however, our survival becomes more depen-\ndent on empirically grounded scientific understanding.\nWe have not yet developed a behavioral theory of\ncollective action based on models of the individual\nconsistent with empirical evidence about how individ-\nuals make decisions in social-dilemma situations. A\nbehavioralcommitment to theory grounded in empir-\nical inquiry is essential if we are to understand such\nbasic questions as why face-to-face communication so\nconsistently enhances cooperation in social dilemmas\nor how structural variables facilitate or impede cffec-\ntive collective action.\n\nSocial dilemmas occur whenever individuals in inter-\ndependent situations face choices in which the maxi-\nmization of short-term self-interest yields outcomes\nleaving all participants worse off than feasible alterna-\ntives. In a public-good dilemma, for example, all those\nwho would benefit from the provision of a public\ngood\u2014such as pollution control, radio broadcasts or\nweather forecasting\u2014find it costly to contribute and\nwould prefer others to pay for the good instead. If\neveryone follows the equilibrium strategy, then the\ngood is not provided or is underprovided Yet, every-\none would be better off if everyone were to contribute.\n\nSocial dilemmas are found in all aspects of life,\nleading to momentous decisions affecting war and\npeace as well as the mundane relationships of keeping\npromises in everyday life.Social dilemmas are called by\nmany names, including the public-good or collective-\ngood problem(Olson 1965, P. Samuelson 1954),shirk-\ning(Alchian and Demsetz 1972), the free-rider prob-\nlem(Edney 1979,Grossman and Hart 1980),moral\nhazard(Holmstrom 1982),the credible commitment\ndilemma(Williams, Collins, and Lichbach 1997), gen-\neralized social exchange (Ekch 1974; Emerson 1972a,\n\nYet, the theory of collective action is the central\nsubject of political science It is the core of the justifi-\ncation for the state. Collective-action problems per-\nvade international relations, face legislators when de-\nvising public budgets, permeate public bureaucracies,\nand are at the core of explanations of voting, interest\ngroup formation,and citizen control of governments in\na democracy. If political scientists do not have an\nempirically grounded theory of collective actio n,then\n\nElinor Ostrom is Arthur F.Bentley Professor of Political Science;\nCo-Director, Workshop in Political Theory and Policy Analysis;and\nCo-Director,Center for the Study of Institut ions,Population,and\nEnvironmental Change; Indiana Universtiy,Bloomington,IN 47408-\n3895.\n\nThe author gratefully acknowledges the support of the National\nScience Foundation(Grant #SBR-9319835 and SBR-9521918),the\nFord Foundation,the Bradley Foundation, and the MacArthur\nFoundation. My heartiest thanks go to James Alt Jose Apesteguia,\nPatrick Brandt, Kathryn Firmin-Sellers, Roy Gardner,Derek Kau-\nneckis,

Fabrice Lehoucq.Margaret Levi, Thomas Lyon, Tony Mate-\njczyk, Mike McGinnis, Trudi Miller, John Orbell, Vincent Ostrom,\nEric Rasmusen David Schmidt, Sujai Shivakumar, Vernon Smith,\nCatherine Tucker, Gcorge Varughese, Jimmy Walker, John Wl-\nliams, Rick Wilson, Toshio Yamagishi,and Xin Zhang for their\ncomments on carlier drafts and to Patty Dalecki for all her excellent\neditorial and moralsupport.\n The term \u201ctragedy of the commons" refers to the proble that\ncommon-pool resources, such as oceans, lakes, forests, irrigation\nsystems, and grazing ands can easily be overused or destroyed if\nproperty rights to these resources are not well defined (sce Hardin\n1968).\n\n1\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\tA Behavioral Approach to the Rational Choice Theory of Collective Action_ Presidential Address, American Political Science Association, 1997 on JSTOR __ Reader View\n\tpage 2\n\tpage 3\n\tpage 4\n\tpage 5\n\tpage 6\n\tpage 7\n\tpage 8\n\tpage 9\n\tpage 10\n\tpage 11\n\tpage 12\n\tpage 13\n\tpage 14\n\tpage 15\n\tpage 16\n\tpage 17\n\tpage 18\n\tpage 19\n\tpage 20\n\tpage 21\n\tpage 22\n\n",
"cloud_doc_url": null}, {"matched_text": "\u301010\u2020source\u3011", "start_idx": 2042, "end_idx": 2053, "alt": null, "type": "file", "name": "SRM DQ4.docx", "id": "file-jrIPCdBup7OEovvS9tDvhMTh", "source": "my_files", "snippet": "Part 1: What are the three dimensions of improvement in Life Cycle Sustainability Assessment suggested in the reading? Describe why these are important and relate and apply the three dimensions to your learning from earlier modules.According to Onat et al. (2017) three key dimensions of improvement are suggested to enhance the effectiveness of sustainability assessments. These dimensions include the integration of environmental economic and social dimensions the application of systems thinking and the active engagement of stakeholders. Each of these elements is vital for constructing a holistic and effective approach to sustainability that transcends the limitations often imposed by capitalist systems which typically prioritize profit at the expense of environmental and social equity.\nThe overall approach to sustainability presented by Onat et al. (2017) emphasizes the necessity of considering the environmental economic and social impacts of products or services throughout their lifecycle. It stands in contrast to and challenges the capitalist tendency to focus solely on economic gains by highlighting the interconnectedness of these dimensions. Ignoring any of these aspects can lead to solutions that might appear beneficial in one area but are detrimental in others.Systems thinking requires understanding the complete lifecycle of a product or service\u2014from raw material extraction to disposal\u2014and identifying potential impacts at each stage. This method helps in pinpointing critical points for intervention and prevents unintended consequences that could arise from changes made in isolation. One can clearly see the links between systems thinking and the ideas presented by Ostrum (1997) which expands the rational choice models to incorporate collective actions that better address complex social dilemmas. It challenges simplistic linear thinking\u2014common in capitalist approaches\u2014that often overlook long-term consequences for immediate profit.\nFinally engaging stakeholders across the lifecycle of a product or service ensures that the diverse values and needs of different groups are considered and addressed in the sustainability assessment process. This approach is crucial for democratizing decision-making processes which often are controlled top-down in capitalist structures. Fisher\u2019s (2020) discussions on how system dynamics modeling can involve stakeholders in understanding and managing complex systems effectively provide a solid argument for stakeholder engagement across the lifecycle. \nBy applying these three dimensions to the broader discussions from earlier modules

it becomes evident how these principles can help counteract the equity and sustainability challenges exacerbated by capitalist systems. These dimensions advocate for a more inclusive holistic and long-term approach to sustainability that aligns with social equity and environmental stewardship rather than focusing narrowly on immediate economic outcomes. This integrated approach not only critiques but actively challenges the inequities perpetuated by capitalist systems paving the way for more sustainable and equitable global practices.\n\nPart 2: What indicators are required to assess the systems dynamics of flow-limited resources? \nTo effectively assess the dynamics of flow-limited resources within a system a systems dynamics model must incorporate several key indicators. These indicators include stocks flows converters/constants and information flows each playing a crucial role in understanding and predicting system behaviors.\nStocks represent the quantities of resources available within the system at any given time. These could be tangible elements like water in a reservoir or abstract quantities such as carbon or even a population count in an ecological study. Stocks are foundational for monitoring resource levels and serve as a baseline for measuring changes over time (Reuter 2013)\nFlows describe the movement of resources between stocks or from external sources into the system. This includes inputs and outputs measured over specific time intervals such as liters of water per hour or tons of carbon per year. Understanding flows is critical for assessing how resources are utilized and replenished within the system providing insights into sustainability and efficiency (Reuter 2013).\nConverters/constants are parameters within the model that affect flows or stocks but remain unchanged regardless of system dynamics. These could include growth rate constants conversion efficiencies or fixed loss rates which are essential for stabilizing the model and making accurate predictions (Reuter 2013).\nInformation flows represent the non-material connections that influence system components by altering flows or converters based on the state of stocks or other variables. This aspect of systems dynamics is crucial for modeling feedback mechanisms and adaptive behaviors within the system allowing for a more nuanced understanding of how changes in one part of the system can ripple through to others (Reuter 2013).\nBy integrating these components into a systems dynamics model it is possible to construct a comprehensive view of how resources are interlinked and governed by various dynamic factors. This holistic approach is vital for predicting future system states under different scenarios and for making informed decisions about resource management and conservation.\nWhat inputs might be incorporated into a model of flow-limited resources? How is this different from stock-limited resources? In resource management two distinct modeling approaches are used to predict and understand resource availability and sustainability: flow-limited and stock-limited models.\nFlow-limited models focus on the dynamics of resource renewal and consumption. These models consider key inputs like the rate at which a resource regenerates whether naturally or through human efforts. They also analyze the consumption rate to see how quickly the resource is being used by various entities or processes. Additionally factors like environmental conditions regulatory policies and technological changes play significant roles in influencing resource availability and flow. This model is dynamic adapting to changes in usage patterns and replenishment strategies providing a flexible framework for forecasting future resource statuses (Reuter 2013).\nIn contrast stock-limited models are concerned with the finite quantities of resources available. They focus on the absolute amount of the resource that exists or can be accessed such as fossil fuels or minerals. These models consider extraction or harvest

rates detailing how quickly the resource is depleted over time. They also evaluate the resource\u2019s regeneration capabilities whether it can be naturally replenished or artificially sustained over long periods. This approach emphasizes the depletion of a fixed stock highlighting the limits of availability and the critical need for conservation and efficient use (Reuter 2013).\nThe main difference between these two models lies in their focus and application. Flow-limited models are dynamic reflecting continuous changes in resource flows and the effects of various influencing factors. They are particularly useful when resources can be renewed or are affected by external conditions. On the other hand stock-limited models deal with resources that have fixed availability concentrating on managing finite supplies and preventing exhaustion. Understanding these differences is crucial for policymakers businesses and conservationists. It helps in developing effective strategies for resource management ensuring sustainability and tackling the challenges posed by limited natural resources (Fisher 2020).\nProvide an example of the systems dynamics of:\nA stock-limited resource (such as cobalt)\nA flow-limited resource (such as rabbits)\nDescribe what and how you would measure the inputs outputs and feedback loops (in-flow out-flow connectors or dependencies stocks and sources or sinks) in each example. Keep it simple (i.e. bamboo production for chairs). You don\u2019t have to do the mathematical calculations just describe the systems process. (If you want to take it further you can use Stella Online Modeling linked above).", "cloud_doc_url": null}, {"matched_text": "\u301011\u2020source\u3011", "start_idx": 2053, "end_idx": 2064, "alt": null, "type": "file", "name": "Week 1_A behavioral approach to the rational choice theory of collective action.pdf", "id": "file-zpqHfXOvQ1oVl3ljWEpbHwWJ", "source": "my_files", "snippet": "\nAmerican Political Science Review Vol. 92, No.1 March 1998\n\nA Behavioral Approach to the Rational Choice Theory of Collective Action\nPresidential Address, American Political Science Association, 1997\nELINOR OSTROM Indiana Universiy\n\n.Txtensive empirical evidence and theoretical developments i multiple disciplines stimulate a need to\nexpand the range of rational choice models to be used as a foundation for the study of social\ndilemmas and collective action. After an introduction to the problem of overcoming social dilemmas\n\nthrough collective ac t io ,th e remainder of this article is divided into six sections. The first briefly reviews the\ntheoretical predictions of curently accepted rational choice theory related to social dilemmas. The second\nsection summarizes the challenges to the sole reliance on a complete model of rationality presented by\nextensive erperimental research. In the third section, I discuss two major empirical findings that begin to\nshow how individuals achieve results that are "better than rational" by building conditions where reciprocity,\nreputation and trust can help to overcome the stong temptations of short-nun self-interest. The fourth\nsection raises the possibiliry of developing second-generation models of rationality, the fifth section develops\nan initial theoretical sc ea rio , and the final section concludes by examining the implications o f placing\nreciprocity reputation and trust at the core of an empirically tested, behavioral theory of collective action.\n\nwe are hand-waving at our central questions. I am\nafraid that we do a lot of hand-waving.\n\net me start with a provocative statement. You\nwould not be reading this article if it were not for\nsome of our ancestors learning how to undertake\n\ncollective action to solve social dilem mas. Successive\ngenerations have added to the stock of everyday knowl-\nedge about how to instill productive norms of behavior\nin their children and to craft rules to support collective\naction that produces public goods and avoids "trage-\ndies of the commons."I What our

ancestors and con-\ntemporaries have learned about engaging in collective\naction for mutual defense,child rearing,and survival is\nnot , however, understood or explained by the extant\ntheory of collective action.\n\nThe lessons of effective collective action are not\nsimple\u2014as is obvious from human history and the\nimmense tragedies that humans have endured ,as well\nas the successes we have realized. As global relation-\nships become even more intricately intertwined and\ncomplex,however, our survival becomes more depen-\ndent on empirically grounded scientific understanding.\nWe have not yet developed a behavioral theory of\ncollective action based on models of the individual\nconsistent with empirical evidence about how individ-\nuals make decisions in social-dilemma situations. A\nbehavioralcommitment to theory grounded in empir-\nical inquiry is essential if we are to understand such\nbasic questions as why face-to-face communication so\nconsistently enhances cooperation in social dilemmas\nor how structural variables facilitate or impede cffec-\ntive collective action.\n\nSocial dilemmas occur whenever individuals in inter-\ndependent situations face choices in which the maxi-\nmization of short-term self-interest yields outcomes\nleaving all participants worse off than feasible alterna-\ntives. In a public-good dilemma, for example, all those\nwho would benefit from the provision of a public\ngood\u2014such as pollution control, radio broadcasts or\nweather forecasting\u2014find it costly to contribute and\nwould prefer others to pay for the good instead. If\neveryone follows the equilibrium strategy, then the\ngood is not provided or is underprovided Yet, every-\none would be better off if everyone were to contribute.\n\nSocial dilemmas are found in all aspects of life,\nleading to momentous decisions affecting war and\npeace as well as the mundane relationships of keeping\npromises in everyday life.Social dilemmas are called by\nmany names, including the public-good or collective-\ngood problem(Olson 1965, P. Samuelson 1954),shirk-\ning(Alchian and Demsetz 1972), the free-rider prob-\nlem(Edney 1979,Grossman and Hart 1980),moral\nhazard(Holmstrom 1982),the credible commitment\ndilemma(Williams, Collins, and Lichbach 1997), gen-\neralized social exchange (Ekch 1974; Emerson 1972a,\n\nYet, the theory of collective action is the central\nsubject of political science It is the core of the justifi-\ncation for the state. Collective-action problems per-\nvade international relations, face legislators when de-\nvising public budgets, permeate public bureaucracies,\nand are at the core of explanations of voting, interest\ngroup formation,and citizen control of governments in\na democracy. If political scientists do not have an\nempirically grounded theory of collective actio n,then\n\nElinor Ostrom is Arthur F.Bentley Professor of Political Science;\nCo-Director, Workshop in Political Theory and Policy Analysis;and\nCo-Director,Center for the Study of Institut
ions,Population,and\nEnvironmental Change; Indiana Universtiy,Bloomington,IN 47408-\n3895.\n\nThe author gratefully acknowledges the support of the National\nScience Foundation(Grant #SBR-9319835 and SBR-9521918),the\nFord Foundation,the Bradley Foundation, and the MacArthur\nFoundation. My heartiest thanks go to James Alt Jose Apesteguia,\nPatrick Brandt, Kathryn Firmin-Sellers, Roy Gardner,Derek Kau-\nneckis, Fabrice Lehoucq.Margaret Levi, Thomas Lyon, Tony Mate-\njczyk, Mike McGinnis, Trudi Miller, John Orbell, Vincent Ostrom,\nEric Rasmusen David Schmidt, Sujai Shivakumar, Vernon Smith,\nCatherine Tucker, Gcorge Varughese, Jimmy Walker, John Wl-\nliams, Rick Wilson, Toshio Yamagishi,and Xin Zhang for their\ncomments on carlier drafts and to Patty Dalecki for all her excellent\neditorial and moralsupport.\n The term \u201ctragedy of the commons" refers to the proble that\ncommon-pool resources, such as oceans, lakes, forests, irrigation\nsystems, and grazing ands can easily be

overused or destroyed if\nproperty rights to these resources are not well defined (sce Hardin\n1968).\n\n1\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\tA Behavioral Approach to the Rational Choice Theory of Collective Action_ Presidential Address, American Political Science Association, 1997 on JSTOR __ Reader View\n\tpage 2\n\tpage 3\n\tpage 4\n\tpage 5\n\tpage 6\n\tpage 7\n\tpage 8\n\tpage 9\n\tpage 10\n\tpage 11\n\tpage 12\n\tpage 13\n\tpage 14\n\tpage 15\n\tpage 16\n\tpage 17\n\tpage 18\n\tpage 19\n\tpage 20\n\tpage 21\n\tpage 22\n\n", "cloud_doc_url": null}, {"matched_text": "\u301011\u2020source\u3011", "start_idx": 2582, "end_idx": 2593, "alt": null, "type": "file", "name": "Week 1_A behavioral approach to the rational choice theory of collective action.pdf", "id": "file-zpqHfXOvQ1oVl3ljWEpbHwWJ", "source": "my_files", "snippet": "\nAmerican Political Science Review Vol. 92, No.1   March 1998\n\nA Behavioral Approach to the Rational Choice Theory of Collective Action\nPresidential Address, American Political Science Association, 1997\nELINOR OSTROM Indiana Universiy\n\n.Txtensive empirical evidence and theoretical developments i multiple disciplines stimulate a need to\nexpand the range of rational choice models to be used as a foundation for the study of social\ndilemmas and collective action. After an introduction to the problem of overcoming social dilemmas\n\nthrough collective ac t io ,th e remainder of this article is divided into six sections. The first briefly reviews the\ntheoretical predictions of curently accepted rational choice theory related to social dilemmas. The second\nsection summarizes the challenges to the sole reliance on a complete model of rationality presented by\nextensive erperimental research. In the third section, I discuss two major empirical findings that begin to\nshow how individuals achieve results that are "better than rational" by building conditions where reciprocity,\nreputation and trust can help to overcome the stong temptations of short-nun self-interest. The fourth\nsection raises the possibiliry of developing second-generation models of rationality, the fifth section develops\nan initial theoretical sc ea rio , and the final section concludes by examining the implications o f placing\nreciprocity reputation and trust at the core of an empirically tested, behavioral theory of collective action.\n\nwe are hand-waving at our central questions. I am\nafraid that we do a lot of hand-waving.\n\net me start with a provocative statement. You\nwould not be reading this article if it were not for\nsome of our ancestors learning how to undertake\n\ncollective action to solve social dilem mas. Successive\ngenerations have added to the stock of everyday knowl-\nedge about how to instill productive norms of behavior\nin their children and to craft rules to support collective\naction that produces public goods and avoids "trage-\ndies of the commons."I What our ancestors and con-\ntemporaries have learned about engaging in collective\naction for mutual defense,child rearing,and survival is\nnot , however, understood or explained by the extant\ntheory of collective action.\n\nThe lessons of effective collective action are not\nsimple\u2014as is obvious from human history and the\nimmense tragedies that humans have endured ,as well\nas the successes we have realized. As global relation-\nships become even more intricately intertwined and\ncomplex,however, our survival becomes more depen-\ndent on empirically grounded scientific understanding.\nWe have not yet developed a behavioral theory of\ncollective action based on models of the individual\nconsistent with empirical evidence about how individ-\nuals make decisions in social-dilemma situations. A\nbehavioralcommitment to theory grounded in empir-\nical inquiry is essential if we are to understand such\nbasic questions as why face-to-face communication so\nconsistently enhances cooperation in social dilemmas\nor how

structural variables facilitate or impede cffec-\ntive collective action.\n\nSocial dilemmas occur whenever individuals in inter-\ndependent situations face choices in which the maxi-\nmization of short-term self-interest yields outcomes\nleaving all participants worse off than feasible alterna-\ntives. In a public-good dilemma, for example, all those\nwho would benefit from the provision of a public\ngood\u2014such as pollution control, radio broadcasts or\nweather forecasting\u2014find it costly to contribute and\nwould prefer others to pay for the good instead. If\neveryone follows the equilibrium strategy, then the\ngood is not provided or is underprovided Yet, every-\none would be better off if everyone were to contribute.\n\nSocial dilemmas are found in all aspects of life,\nleading to momentous decisions affecting war and\npeace as well as the mundane relationships of keeping\npromises in everyday life.Social dilemmas are called by\nmany names, including the public-good or collective-\ngood problem(Olson 1965, P. Samuelson 1954),shirk-\ning(Alchian and Demsetz 1972), the free-rider prob-\nlem(Edney 1979,Grossman and Hart 1980),moral\nhazard(Holmstrom 1982),the credible commitment\ndilemma(Williams, Collins, and Lichbach 1997), gen-\neralized social exchange (Ekch 1974; Emerson 1972a,\n\nYet, the theory of collective action is the central\nsubject of political science It is the core of the justifi-\ncation for the state. Collective-action problems per-\nvade international relations, face legislators when de-\nvising public budgets, permeate public bureaucracies,\nand are at the core of explanations of voting, interest\ngroup formation,and citizen control of governments in\na democracy. If political scientists do not have an\nempirically grounded theory of collective actio n,then\n\nElinor Ostrom is Arthur F.Bentley Professor of Political Science;\nCo-Director, Workshop in Political Theory and Policy Analysis;and\nCo-Director,Center for the Study of Institut ions,Population,and\nEnvironmental Change; Indiana Universtiy,Bloomington,IN 47408-\n3895.\n\nThe author gratefully acknowledges the support of the National\nScience Foundation(Grant #SBR-9319835 and SBR-9521918),the\nFord Foundation,the Bradley Foundation, and the MacArthur\nFoundation. My heartiest thanks go to James Alt Jose Apesteguia,\nPatrick Brandt, Kathryn Firmin-Sellers, Roy Gardner,Derek Kau-\nneckis, Fabrice Lehoucq.Margaret Levi, Thomas Lyon, Tony Mate-\njczyk, Mike McGinnis, Trudi Miller, John Orbell, Vincent Ostrom,\nEric Rasmusen David Schmidt, Sujai Shivakumar, Vernon Smith,\nCatherine Tucker, Gcorge Varughese, Jimmy Walker, John Wl-\nliams, Rick Wilson, Toshio Yamagishi,and Xin Zhang for their\ncomments on carlier drafts and to Patty Dalecki for all her excellent\neditorial and moralsupport.\n The term \u201ctragedy of the commons" refers to the proble that\ncommon-pool resources, such as oceans, lakes, forests, irrigation\nsystems, and grazing ands can easily be overused or destroyed if\nproperty rights to these resources are not well defined (sce Hardin\n1968).\n\n1\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\tA Behavioral Approach to the Rational Choice Theory of Collective Action_ Presidential Address, American Political Science Association, 1997 on JSTOR __ Reader View\n\tpage 2\n\tpage 3\n\tpage 4\n\tpage 5\n\tpage 6\n\tpage 7\n\tpage 8\n\tpage 9\n\tpage 10\n\tpage 11\n\tpage 12\n\tpage 13\n\tpage 14\n\tpage 15\n\tpage 16\n\tpage 17\n\tpage 18\n\tpage 19\n\tpage 20\n\tpage 21\n\tpage 22\n\n", "cloud_doc_url": null}, {"matched_text": "\u301010\u2020source\u3011", "start_idx": 2971, "end_idx": 2982, "alt": null, "type": "file", "name": "SRM DQ4.docx", "id": "file-jrIPCdBup7OEovvS9tDvhMTh", "source": "my_files", "snippet": "Part 1: What are the three dimensions of improvement in Life Cycle Sustainability Assessment suggested in the reading? Describe why these are important and relate and apply the three dimensions to your learning from earlier modules.According to Onat et al. (2017) three

key dimensions of improvement are suggested to enhance the effectiveness of sustainability assessments. These dimensions include the integration of environmental economic and social dimensions the application of systems thinking and the active engagement of stakeholders. Each of these elements is vital for constructing a holistic and effective approach to sustainability that transcends the limitations often imposed by capitalist systems which typically prioritize profit at the expense of environmental and social equity.\nThe overall approach to sustainability presented by Onat et al. (2017) emphasizes the necessity of considering the environmental economic and social impacts of products or services throughout their lifecycle. It stands in contrast to and challenges the capitalist tendency to focus solely on economic gains by highlighting the interconnectedness of these dimensions. Ignoring any of these aspects can lead to solutions that might appear beneficial in one area but are detrimental in others.Systems thinking requires understanding the complete lifecycle of a product or service\u2014from raw material extraction to disposal\u2014and identifying potential impacts at each stage. This method helps in pinpointing critical points for intervention and prevents unintended consequences that could arise from changes made in isolation. One can clearly see the links between systems thinking and the ideas presented by Ostrum (1997) which expands the rational choice models to incorporate collective actions that better address complex social dilemmas. It challenges simplistic linear thinking\u2014common in capitalist approaches\u2014that often overlook long-term consequences for immediate profit.\nFinally engaging stakeholders across the lifecycle of a product or service ensures that the diverse values and needs of different groups are considered and addressed in the sustainability assessment process. This approach is crucial for democratizing decision-making processes which often are controlled top-down in capitalist structures. Fisher\u2019s (2020) discussions on how system dynamics modeling can involve stakeholders in understanding and managing complex systems effectively provide a solid argument for stakeholder engagement across the lifecycle. \nBy applying these three dimensions to the broader discussions from earlier modules it becomes evident how these principles can help counteract the equity and sustainability challenges exacerbated by capitalist systems. These dimensions advocate for a more inclusive holistic and long-term approach to sustainability that aligns with social equity and environmental stewardship rather than focusing narrowly on immediate economic outcomes. This integrated approach not only critiques but actively challenges the inequities perpetuated by capitalist systems paving the way for more sustainable and equitable global practices.\n\nPart 2: What indicators are required to assess the systems dynamics of flow-limited resources? \nTo effectively assess the dynamics of flow-limited resources within a system a systems dynamics model must incorporate several key indicators. These indicators include stocks flows converters/constants and information flows each playing a crucial role in understanding and predicting system behaviors.\nStocks represent the quantities of resources available within the system at any given time. These could be tangible elements like water in a reservoir or abstract quantities such as carbon or even a population count in an ecological study. Stocks are foundational for monitoring resource levels and serve as a baseline for measuring changes over time (Reuter 2013)\nFlows describe the movement of resources between stocks or from external sources into the system. This includes inputs and outputs measured over specific time intervals such as liters of water per hour or tons of carbon per year. Understanding flows is critical for assessing how resources are utilized and replenished within the

system providing insights into sustainability and efficiency (Reuter 2013).\nConverters/constants are parameters within the model that affect flows or stocks but remain unchanged regardless of system dynamics. These could include growth rate constants conversion efficiencies or fixed loss rates which are essential for stabilizing the model and making accurate predictions (Reuter 2013).\nInformation flows represent the non-material connections that influence system components by altering flows or converters based on the state of stocks or other variables. This aspect of systems dynamics is crucial for modeling feedback mechanisms and adaptive behaviors within the system allowing for a more nuanced understanding of how changes in one part of the system can ripple through to others (Reuter 2013).\nBy integrating these components into a systems dynamics model it is possible to construct a comprehensive view of how resources are interlinked and governed by various dynamic factors. This holistic approach is vital for predicting future system states under different scenarios and for making informed decisions about resource management and conservation.\nWhat inputs might be incorporated into a model of flow-limited resources? How is this different from stock-limited resources? In resource management two distinct modeling approaches are used to predict and understand resource availability and sustainability: flow-limited and stock-limited models.\nFlow-limited models focus on the dynamics of resource renewal and consumption. These models consider key inputs like the rate at which a resource regenerates whether naturally or through human efforts. They also analyze the consumption rate to see how quickly the resource is being used by various entities or processes. Additionally factors like environmental conditions regulatory policies and technological changes play significant roles in influencing resource availability and flow. This model is dynamic adapting to changes in usage patterns and replenishment strategies providing a flexible framework for forecasting future resource statuses (Reuter 2013).\nIn contrast stock-limited models are concerned with the finite quantities of resources available. They focus on the absolute amount of the resource that exists or can be accessed such as fossil fuels or minerals. These models consider extraction or harvest rates detailing how quickly the resource is depleted over time. They also evaluate the resource\u2019s regeneration capabilities whether it can be naturally replenished or artificially sustained over long periods. This approach emphasizes the depletion of a fixed stock highlighting the limits of availability and the critical need for conservation and efficient use (Reuter 2013).\nThe main difference between these two models lies in their focus and application. Flow-limited models are dynamic reflecting continuous changes in resource flows and the effects of various influencing factors. They are particularly useful when resources can be renewed or are affected by external conditions. On the other hand stock-limited models deal with resources that have fixed availability concentrating on managing finite supplies and preventing exhaustion. Understanding these differences is crucial for policymakers businesses and conservationists. It helps in developing effective strategies for resource management ensuring sustainability and tackling the challenges posed by limited natural resources (Fisher 2020).\nProvide an example of the systems dynamics of:\nA stock-limited resource (such as cobalt)\nA flow-limited resource (such as rabbits)\nDescribe what and how you would measure the inputs outputs and feedback loops (in-flow out-flow connectors or dependencies stocks and sources or sinks) in each example. Keep it simple (i.e. bamboo production for chairs). You don\u2019t have to do the mathematical calculations just describe the systems process. (If you want to take it further you can use Stella Online Modeling linked above).", "cloud_doc_url": null},

{"matched_text": "\u301011\u2020source\u3011", "start_idx": 2982, "end_idx": 2993, "alt": null, "type": "file", "name": "Week 1_A behavioral approach to the rational choice theory of collective action.pdf", "id": "file-zpqHfXOvQ1oVl3ljWEpbHwWJ", "source": "my_files", "snippet": "\nAmerican Political Science Review Vol. 92, No.1 March 1998\n\nA Behavioral Approach to the Rational Choice Theory of Collective Action\nPresidential Address, American Political Science Association, 1997\nELINOR OSTROM Indiana Universiy\n\n.Txtensive empirical evidence and theoretical developments i multiple disciplines stimulate a need to\nexpand the range of rational choice models to be used as a foundation for the study of social\ndilemmas and collective action. After an introduction to the problem of overcoming social dilemmas\n\nthrough collective ac t io ,th e remainder of this article is divided into six sections. The first briefly reviews the\ntheoretical predictions of curently accepted rational choice theory related to social dilemmas. The second\nsection summarizes the challenges to the sole reliance on a complete model of rationality presented by\nextensive erperimental research. In the third section, I discuss two major empirical findings that begin to\nshow how individuals achieve results that are "better than rational" by building conditions where reciprocity,\nreputation and trust can help to overcome the stong temptations of short-nun self-interest. The fourth\nsection raises the possibiliry of developing second-generation models of rationality, the fifth section develops\nan initial theoretical sc ea rio , and the final section concludes by examining the implications o f placing\nreciprocity reputation and trust at the core of an empirically tested, behavioral theory of collective action.\n\nwe are hand-waving at our central questions. I am\nafraid that we do a lot of hand-waving.\n\net me start with a provocative statement. You\nwould not be reading this article if it were not for\nsome of our ancestors learning how to undertake\n\ncollective action to solve social dilem mas. Successive\ngenerations have added to the stock of everyday knowl-\nedge about how to instill productive norms of behavior\nin their children and to craft rules to support collective\naction that produces public goods and avoids "trage-\ndies of the commons."I What our ancestors and con-\ntemporaries have learned about engaging in collective\naction for mutual defense,child rearing,and survival is\nnot , however, understood or explained by the extant\ntheory of collective action.\n\nThe lessons of effective collective action are not\nsimple\u2014as is obvious from human history and the\nimmense tragedies that humans have endured ,as well\nas the successes we have realized. As global relation-\nships become even more intricately intertwined and\ncomplex,however, our survival becomes more depen-\ndent on empirically grounded scientific understanding.\nWe have not yet developed a behavioral theory of\ncollective action based on models of the individual\nconsistent with empirical evidence about how individ-\nuals make decisions in social-dilemma situations. A\nbehavioralcommitment to theory grounded in empir-\nical inquiry is essential if we are to understand such\nbasic questions as why face-to-face communication so\nconsistently enhances cooperation in social dilemmas\nor how structural variables facilitate or impede cffec-\ntive collective action.\n\nSocial dilemmas occur whenever individuals in inter-\ndependent situations face choices in which the maxi-\nmization of short-term self-interest yields outcomes\nleaving all participants worse off than feasible alterna-\ntives. In a public-good dilemma, for example, all those\nwho would benefit from the provision of a public\ngood\u2014such as pollution control, radio broadcasts or\nweather forecasting\u2014find it costly to contribute and\nwould prefer others to pay for the good instead. If\neveryone follows the equilibrium strategy, then

the\ngood is not provided or is underprovided Yet, every-\none would be better off if everyone were to contribute.\n\nSocial dilemmas are found in all aspects of life,\nleading to momentous decisions affecting war and\npeace as well as the mundane relationships of keeping\npromises in everyday life.Social dilemmas are called by\nmany names, including the public-good or collective-\ngood problem(Olson 1965, P. Samuelson 1954),shirk-\ning(Alchian and Demsetz 1972), the free-rider prob-\nlem(Edney 1979,Grossman and Hart 1980),moral\nhazard(Holmstrom 1982),the credible commitment\ndilemma(Williams, Collins, and Lichbach 1997), gen-\neralized social exchange (Ekch 1974; Emerson 1972a,\n\nYet, the theory of collective action is the central\nsubject of political science It is the core of the justifi-\ncation for the state. Collective-action problems per-\nvade international relations, face legislators when de-\nvising public budgets, permeate public bureaucracies,\nand are at the core of explanations of voting, interest\ngroup formation,and citizen control of governments in\na democracy. If political scientists do not have an\nempirically grounded theory of collective actio n,then\n\nElinor Ostrom is Arthur F.Bentley Professor of Political Science;\nCo-Director, Workshop in Political Theory and Policy Analysis;and\nCo-Director,Center for the Study of Institut ions,Population,and\nEnvironmental Change; Indiana Universtiy,Bloomington,IN 47408-\n3895.\n\nThe author gratefully acknowledges the support of the National\nScience Foundation(Grant #SBR-9319835 and SBR-9521918),the\nFord Foundation,the Bradley Foundation, and the MacArthur\nFoundation. My heartiest thanks go to James Alt Jose Apesteguia,\nPatrick Brandt, Kathryn Firmin-Sellers, Roy Gardner,Derek Kau-\nneckis, Fabrice Lehoucq.Margaret Levi, Thomas Lyon, Tony Mate-\njczyk, Mike McGinnis, Trudi Miller, John Orbell, Vincent Ostrom,\nEric Rasmusen David Schmidt, Sujai Shivakumar, Vernon Smith,\nCatherine Tucker, Gcorge Varughese, Jimmy Walker, John Wl-\nliams, Rick Wilson, Toshio Yamagishi,and Xin Zhang for their\ncomments on carlier drafts and to Patty Dalecki for all her excellent\neditorial and moralsupport.\n The term \u201ctragedy of the commons" refers to the proble that\ncommon-pool resources, such as oceans, lakes, forests, irrigation\nsystems, and grazing ands can easily be overused or destroyed if\nproperty rights to these resources are not well defined (sce Hardin\n1968).\n\n1\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\tA Behavioral Approach to the Rational Choice Theory of Collective Action_ Presidential Address, American Political Science Association, 1997 on JSTOR __ Reader View\n\tpage 2\n\tpage 3\n\tpage 4\n\tpage 5\n\tpage 6\n\tpage 7\n\tpage 8\n\tpage 9\n\tpage 10\n\tpage 11\n\tpage 12\n\tpage 13\n\tpage 14\n\tpage 15\n\tpage 16\n\tpage 17\n\tpage 18\n\tpage 19\n\tpage 20\n\tpage 21\n\tpage 22\n\n", "cloud_doc_url": null}, {"matched_text": "\u301010\u2020source\u3011", "start_idx": 3450, "end_idx": 3461, "alt": null, "type": "file", "name": "SRM DQ4.docx", "id": "file-jrIPCdBup7OEovvS9tDvhMTh", "source": "my_files", "snippet": "Part 1: What are the three dimensions of improvement in Life Cycle Sustainability Assessment suggested in the reading? Describe why these are important and relate and apply the three dimensions to your learning from earlier modules.According to Onat et al. (2017) three key dimensions of improvement are suggested to enhance the effectiveness of sustainability assessments. These dimensions include the integration of environmental economic and social dimensions the application of systems thinking and the active engagement of stakeholders. Each of these elements is vital for constructing a holistic and effective approach to sustainability that transcends the limitations often imposed by capitalist systems which typically prioritize profit at the expense of environmental and social equity.\nThe overall approach to sustainability presented

by Onat et al. (2017) emphasizes the necessity of considering the environmental economic and social impacts of products or services throughout their lifecycle. It stands in contrast to and challenges the capitalist tendency to focus solely on economic gains by highlighting the interconnectedness of these dimensions. Ignoring any of these aspects can lead to solutions that might appear beneficial in one area but are detrimental in others.Systems thinking requires understanding the complete lifecycle of a product or service\u2014from raw material extraction to disposal\u2014and identifying potential impacts at each stage. This method helps in pinpointing critical points for intervention and prevents unintended consequences that could arise from changes made in isolation. One can clearly see the links between systems thinking and the ideas presented by Ostrum (1997) which expands the rational choice models to incorporate collective actions that better address complex social dilemmas. It challenges simplistic linear thinking\u2014common in capitalist approaches\u2014that often overlook long-term consequences for immediate profit.\nFinally engaging stakeholders across the lifecycle of a product or service ensures that the diverse values and needs of different groups are considered and addressed in the sustainability assessment process. This approach is crucial for democratizing decision-making processes which often are controlled top-down in capitalist structures. Fisher\u2019s (2020) discussions on how system dynamics modeling can involve stakeholders in understanding and managing complex systems effectively provide a solid argument for stakeholder engagement across the lifecycle. \nBy applying these three dimensions to the broader discussions from earlier modules it becomes evident how these principles can help counteract the equity and sustainability challenges exacerbated by capitalist systems. These dimensions advocate for a more inclusive holistic and long-term approach to sustainability that aligns with social equity and environmental stewardship rather than focusing narrowly on immediate economic outcomes. This integrated approach not only critiques but actively challenges the inequities perpetuated by capitalist systems paving the way for more sustainable and equitable global practices.\n\nPart 2: What indicators are required to assess the systems dynamics of flow-limited resources? \nTo effectively assess the dynamics of flow-limited resources within a system a systems dynamics model must incorporate several key indicators. These indicators include stocks flows converters/constants and information flows each playing a crucial role in understanding and predicting system behaviors.\nStocks represent the quantities of resources available within the system at any given time. These could be tangible elements like water in a reservoir or abstract quantities such as carbon or even a population count in an ecological study. Stocks are foundational for monitoring resource levels and serve as a baseline for measuring changes over time (Reuter 2013)\nFlows describe the movement of resources between stocks or from external sources into the system. This includes inputs and outputs measured over specific time intervals such as liters of water per hour or tons of carbon per year. Understanding flows is critical for assessing how resources are utilized and replenished within the system providing insights into sustainability and efficiency (Reuter 2013).\nConverters/constants are parameters within the model that affect flows or stocks but remain unchanged regardless of system dynamics. These could include growth rate constants conversion efficiencies or fixed loss rates which are essential for stabilizing the model and making accurate predictions (Reuter 2013).\nInformation flows represent the non-material connections that influence system components by altering flows or converters based on the state of stocks or other variables. This

aspect of systems dynamics is crucial for modeling feedback mechanisms and adaptive behaviors within the system allowing for a more nuanced understanding of how changes in one part of the system can ripple through to others (Reuter 2013).\nBy integrating these components into a systems dynamics model it is possible to construct a comprehensive view of how resources are interlinked and governed by various dynamic factors. This holistic approach is vital for predicting future system states under different scenarios and for making informed decisions about resource management and conservation.\nWhat inputs might be incorporated into a model of flow-limited resources? How is this different from stock-limited resources? In resource management two distinct modeling approaches are used to predict and understand resource availability and sustainability: flow-limited and stock-limited models.\nFlow-limited models focus on the dynamics of resource renewal and consumption. These models consider key inputs like the rate at which a resource regenerates whether naturally or through human efforts. They also analyze the consumption rate to see how quickly the resource is being used by various entities or processes. Additionally factors like environmental conditions regulatory policies and technological changes play significant roles in influencing resource availability and flow. This model is dynamic adapting to changes in usage patterns and replenishment strategies providing a flexible framework for forecasting future resource statuses (Reuter 2013).\nIn contrast stock-limited models are concerned with the finite quantities of resources available. They focus on the absolute amount of the resource that exists or can be accessed such as fossil fuels or minerals. These models consider extraction or harvest rates detailing how quickly the resource is depleted over time. They also evaluate the resource\u2019s regeneration capabilities whether it can be naturally replenished or artificially sustained over long periods. This approach emphasizes the depletion of a fixed stock highlighting the limits of availability and the critical need for conservation and efficient use (Reuter 2013).\nThe main difference between these two models lies in their focus and application. Flow-limited models are dynamic reflecting continuous changes in resource flows and the effects of various influencing factors. They are particularly useful when resources can be renewed or are affected by external conditions. On the other hand stock-limited models deal with resources that have fixed availability concentrating on managing finite supplies and preventing exhaustion. Understanding these differences is crucial for policymakers businesses and conservationists. It helps in developing effective strategies for resource management ensuring sustainability and tackling the challenges posed by limited natural resources (Fisher 2020).\nProvide an example of the systems dynamics of:\nA stock-limited resource (such as cobalt)\nA flow-limited resource (such as rabbits)\nDescribe what and how you would measure the inputs outputs and feedback loops (in-flow out-flow connectors or dependencies stocks and sources or sinks) in each example. Keep it simple (i.e. bamboo production for chairs). You don\u2019t have to do the mathematical calculations just describe the systems process. (If you want to take it further you can use Stella Online Modeling linked above).", "cloud_doc_url": null}, {"matched_text": "\u301010\u2020source\u3011", "start_idx": 3742, "end_idx": 3753, "alt": null, "type": "file", "name": "SRM DQ4.docx", "id": "file-jrIPCdBup7OEovvS9tDvhMTh", "source": "my_files", "snippet": "Part 1: What are the three dimensions of improvement in Life Cycle Sustainability Assessment suggested in the reading? Describe why these are important and relate and apply the three dimensions to your learning from earlier modules.According to Onat et al. (2017) three key dimensions of improvement are suggested to enhance the effectiveness of

sustainability assessments. These dimensions include the integration of environmental economic and social dimensions the application of systems thinking and the active engagement of stakeholders. Each of these elements is vital for constructing a holistic and effective approach to sustainability that transcends the limitations often imposed by capitalist systems which typically prioritize profit at the expense of environmental and social equity.\nThe overall approach to sustainability presented by Onat et al. (2017) emphasizes the necessity of considering the environmental economic and social impacts of products or services throughout their lifecycle. It stands in contrast to and challenges the capitalist tendency to focus solely on economic gains by highlighting the interconnectedness of these dimensions. Ignoring any of these aspects can lead to solutions that might appear beneficial in one area but are detrimental in others.Systems thinking requires understanding the complete lifecycle of a product or service\u2014from raw material extraction to disposal\u2014and identifying potential impacts at each stage. This method helps in pinpointing critical points for intervention and prevents unintended consequences that could arise from changes made in isolation. One can clearly see the links between systems thinking and the ideas presented by Ostrum (1997) which expands the rational choice models to incorporate collective actions that better address complex social dilemmas. It challenges simplistic linear thinking\u2014common in capitalist approaches\u2014that often overlook long-term consequences for immediate profit.\nFinally engaging stakeholders across the lifecycle of a product or service ensures that the diverse values and needs of different groups are considered and addressed in the sustainability assessment process. This approach is crucial for democratizing decision-making processes which often are controlled top-down in capitalist structures. Fisher\u2019s (2020) discussions on how system dynamics modeling can involve stakeholders in understanding and managing complex systems effectively provide a solid argument for stakeholder engagement across the lifecycle. \nBy applying these three dimensions to the broader discussions from earlier modules it becomes evident how these principles can help counteract the equity and sustainability challenges exacerbated by capitalist systems. These dimensions advocate for a more inclusive holistic and long-term approach to sustainability that aligns with social equity and environmental stewardship rather than focusing narrowly on immediate economic outcomes. This integrated approach not only critiques but actively challenges the inequities perpetuated by capitalist systems paving the way for more sustainable and equitable global practices.\n\nPart 2: What indicators are required to assess the systems dynamics of flow-limited resources? \nTo effectively assess the dynamics of flow-limited resources within a system a systems dynamics model must incorporate several key indicators. These indicators include stocks flows converters/constants and information flows each playing a crucial role in understanding and predicting system behaviors.\nStocks represent the quantities of resources available within the system at any given time. These could be tangible elements like water in a reservoir or abstract quantities such as carbon or even a population count in an ecological study. Stocks are foundational for monitoring resource levels and serve as a baseline for measuring changes over time (Reuter 2013)\nFlows describe the movement of resources between stocks or from external sources into the system. This includes inputs and outputs measured over specific time intervals such as liters of water per hour or tons of carbon per year. Understanding flows is critical for assessing how resources are utilized and replenished within the system providing insights into sustainability and efficiency (Reuter

2013).\nConverters/constants are parameters within the model that affect flows or stocks but remain unchanged regardless of system dynamics. These could include growth rate constants conversion efficiencies or fixed loss rates which are essential for stabilizing the model and making accurate predictions (Reuter 2013).\nInformation flows represent the non-material connections that influence system components by altering flows or converters based on the state of stocks or other variables. This aspect of systems dynamics is crucial for modeling feedback mechanisms and adaptive behaviors within the system allowing for a more nuanced understanding of how changes in one part of the system can ripple through to others (Reuter 2013).\nBy integrating these components into a systems dynamics model it is possible to construct a comprehensive view of how resources are interlinked and governed by various dynamic factors. This holistic approach is vital for predicting future system states under different scenarios and for making informed decisions about resource management and conservation.\nWhat inputs might be incorporated into a model of flow-limited resources? How is this different from stock-limited resources? In resource management two distinct modeling approaches are used to predict and understand resource availability and sustainability: flow-limited and stock-limited models.\nFlow-limited models focus on the dynamics of resource renewal and consumption. These models consider key inputs like the rate at which a resource regenerates whether naturally or through human efforts. They also analyze the consumption rate to see how quickly the resource is being used by various entities or processes. Additionally factors like environmental conditions regulatory policies and technological changes play significant roles in influencing resource availability and flow. This model is dynamic adapting to changes in usage patterns and replenishment strategies providing a flexible framework for forecasting future resource statuses (Reuter 2013).\nIn contrast stock-limited models are concerned with the finite quantities of resources available. They focus on the absolute amount of the resource that exists or can be accessed such as fossil fuels or minerals. These models consider extraction or harvest rates detailing how quickly the resource is depleted over time. They also evaluate the resource\u2019s regeneration capabilities whether it can be naturally replenished or artificially sustained over long periods. This approach emphasizes the depletion of a fixed stock highlighting the limits of availability and the critical need for conservation and efficient use (Reuter 2013).\nThe main difference between these two models lies in their focus and application. Flow-limited models are dynamic reflecting continuous changes in resource flows and the effects of various influencing factors. They are particularly useful when resources can be renewed or are affected by external conditions. On the other hand stock-limited models deal with resources that have fixed availability concentrating on managing finite supplies and preventing exhaustion. Understanding these differences is crucial for policymakers businesses and conservationists. It helps in developing effective strategies for resource management ensuring sustainability and tackling the challenges posed by limited natural resources (Fisher 2020).\nProvide an example of the systems dynamics of:\nA stock-limited resource (such as cobalt)\nA flow-limited resource (such as rabbits)\nDescribe what and how you would measure the inputs outputs and feedback loops (in-flow out-flow connectors or dependencies stocks and sources or sinks) in each example. Keep it simple (i.e. bamboo production for chairs). You don\u2019t have to do the mathematical calculations just describe the systems process. (If you want to take it further you can use Stella Online Modeling linked above).", "cloud_doc_url": null}, {"matched_text": "\u301010\u2020source\u3011", "start_idx": 4138, "end_idx": 4149,

"alt": null, "type": "file", "name": "SRM DQ4.docx", "id": "file-jrIPCdBup7OEovvS9tDvhMTh", "source": "my_files", "snippet": "Part 1: What are the three dimensions of improvement in Life Cycle Sustainability Assessment suggested in the reading? Describe why these are important and relate and apply the three dimensions to your learning from earlier modules.According to Onat et al. (2017) three key dimensions of improvement are suggested to enhance the effectiveness of sustainability assessments. These dimensions include the integration of environmental economic and social dimensions the application of systems thinking and the active engagement of stakeholders. Each of these elements is vital for constructing a holistic and effective approach to sustainability that transcends the limitations often imposed by capitalist systems which typically prioritize profit at the expense of environmental and social equity.\nThe overall approach to sustainability presented by Onat et al. (2017) emphasizes the necessity of considering the environmental economic and social impacts of products or services throughout their lifecycle. It stands in contrast to and challenges the capitalist tendency to focus solely on economic gains by highlighting the interconnectedness of these dimensions. Ignoring any of these aspects can lead to solutions that might appear beneficial in one area but are detrimental in others.Systems thinking requires understanding the complete lifecycle of a product or service\u2014from raw material extraction to disposal\u2014and identifying potential impacts at each stage. This method helps in pinpointing critical points for intervention and prevents unintended consequences that could arise from changes made in isolation. One can clearly see the links between systems thinking and the ideas presented by Ostrum (1997) which expands the rational choice models to incorporate collective actions that better address complex social dilemmas. It challenges simplistic linear thinking\u2014common in capitalist approaches\u2014that often overlook long-term consequences for immediate profit.\nFinally engaging stakeholders across the lifecycle of a product or service ensures that the diverse values and needs of different groups are considered and addressed in the sustainability assessment process. This approach is crucial for democratizing decision-making processes which often are controlled top-down in capitalist structures. Fisher\u2019s (2020) discussions on how system dynamics modeling can involve stakeholders in understanding and managing complex systems effectively provide a solid argument for stakeholder engagement across the lifecycle. \nBy applying these three dimensions to the broader discussions from earlier modules it becomes evident how these principles can help counteract the equity and sustainability challenges exacerbated by capitalist systems. These dimensions advocate for a more inclusive holistic and long-term approach to sustainability that aligns with social equity and environmental stewardship rather than focusing narrowly on immediate economic outcomes. This integrated approach not only critiques but actively challenges the inequities perpetuated by capitalist systems paving the way for more sustainable and equitable global practices.\n\nPart 2: What indicators are required to assess the systems dynamics of flow-limited resources? \nTo effectively assess the dynamics of flow-limited resources within a system a systems dynamics model must incorporate several key indicators. These indicators include stocks flows converters/constants and information flows each playing a crucial role in understanding and predicting system behaviors.\nStocks represent the quantities of resources available within the system at any given time. These could be tangible elements like water in a reservoir or abstract quantities such as carbon or even a population count in an ecological study. Stocks are foundational for monitoring

resource levels and serve as a baseline for measuring changes over time (Reuter 2013)\nFlows describe the movement of resources between stocks or from external sources into the system. This includes inputs and outputs measured over specific time intervals such as liters of water per hour or tons of carbon per year. Understanding flows is critical for assessing how resources are utilized and replenished within the system providing insights into sustainability and efficiency (Reuter 2013).\nConverters/constants are parameters within the model that affect flows or stocks but remain unchanged regardless of system dynamics. These could include growth rate constants conversion efficiencies or fixed loss rates which are essential for stabilizing the model and making accurate predictions (Reuter 2013).\nInformation flows represent the non-material connections that influence system components by altering flows or converters based on the state of stocks or other variables. This aspect of systems dynamics is crucial for modeling feedback mechanisms and adaptive behaviors within the system allowing for a more nuanced understanding of how changes in one part of the system can ripple through to others (Reuter 2013).\nBy integrating these components into a systems dynamics model it is possible to construct a comprehensive view of how resources are interlinked and governed by various dynamic factors. This holistic approach is vital for predicting future system states under different scenarios and for making informed decisions about resource management and conservation.\nWhat inputs might be incorporated into a model of flow-limited resources? How is this different from stock-limited resources? In resource management two distinct modeling approaches are used to predict and understand resource availability and sustainability: flow-limited and stock-limited models.\nFlow-limited models focus on the dynamics of resource renewal and consumption. These models consider key inputs like the rate at which a resource regenerates whether naturally or through human efforts. They also analyze the consumption rate to see how quickly the resource is being used by various entities or processes. Additionally factors like environmental conditions regulatory policies and technological changes play significant roles in influencing resource availability and flow. This model is dynamic adapting to changes in usage patterns and replenishment strategies providing a flexible framework for forecasting future resource statuses (Reuter 2013).\nIn contrast stock-limited models are concerned with the finite quantities of resources available. They focus on the absolute amount of the resource that exists or can be accessed such as fossil fuels or minerals. These models consider extraction or harvest rates detailing how quickly the resource is depleted over time. They also evaluate the resource\u2019s regeneration capabilities whether it can be naturally replenished or artificially sustained over long periods. This approach emphasizes the depletion of a fixed stock highlighting the limits of availability and the critical need for conservation and efficient use (Reuter 2013).\nThe main difference between these two models lies in their focus and application. Flow-limited models are dynamic reflecting continuous changes in resource flows and the effects of various influencing factors. They are particularly useful when resources can be renewed or are affected by external conditions. On the other hand stock-limited models deal with resources that have fixed availability concentrating on managing finite supplies and preventing exhaustion. Understanding these differences is crucial for policymakers businesses and conservationists. It helps in developing effective strategies for resource management ensuring sustainability and tackling the challenges posed by limited natural resources (Fisher 2020).\nProvide an example of the systems dynamics of:\nA stock-limited resource (such as cobalt)\nA flow-limited resource (such as rabbits)\nDescribe what

and how you would measure the inputs outputs and feedback loops (in-flow out-flow connectors or dependencies stocks and sources or sinks) in each example. Keep it simple (i.e. bamboo production for chairs). You don\u2019t have to do the mathematical calculations just describe the systems process. (If you want to take it further you can use Stella Online Modeling linked above).", "cloud_doc_url": null}, {"matched_text": "\u301011\u2020source\u3011", "start_idx": 4523, "end_idx": 4534, "alt": null, "type": "file", "name": "Week 1_A behavioral approach to the rational choice theory of collective action.pdf", "id": "file-zpqHfXOvQ1oVl3ljWEpbHwWJ", "source": "my_files", "snippet": "\nAmerican Political Science Review Vol. 92, No.1 March 1998\n\nA Behavioral Approach to the Rational Choice Theory of Collective Action\nPresidential Address, American Political Science Association, 1997\nELINOR OSTROM Indiana Universiy\n\n.Txtensive empirical evidence and theoretical developments i multiple disciplines stimulate a need to\nexpand the range of rational choice models to be used as a foundation for the study of social\ndilemmas and collective action. After an introduction to the problem of overcoming social dilemmas\n\nthrough collective ac t io ,th e remainder of this article is divided into six sections. The first briefly reviews the\ntheoretical predictions of curently accepted rational choice theory related to social dilemmas. The second\nsection summarizes the challenges to the sole reliance on a complete model of rationality presented by\nextensive erperimental research. In the third section, I discuss two major empirical findings that begin to\nshow how individuals achieve results that are "better than rational" by building conditions where reciprocity,\nreputation and trust can help to overcome the stong temptations of short-nun self-interest. The fourth\nsection raises the possibiliry of developing second-generation models of rationality, the fifth section develops\nan initial theoretical sc ea rio , and the final section concludes by examining the implications o f placing\nreciprocity reputation and trust at the core of an empirically tested, behavioral theory of collective action.\n\nwe are hand-waving at our central questions. I am\nafraid that we do a lot of hand-waving.\n\net me start with a provocative statement. You\nwould not be reading this article if it were not for\nsome of our ancestors learning how to undertake\n\ncollective action to solve social dilem mas. Successive\ngenerations have added to the stock of everyday knowl-\nedge about how to instill productive norms of behavior\nin their children and to craft rules to support collective\naction that produces public goods and avoids "trage-\ndies of the commons."I What our ancestors and con-\ntemporaries have learned about engaging in collective\naction for mutual defense,child rearing,and survival is\nnot , however, understood or explained by the extant\ntheory of collective action.\n\nThe lessons of effective collective action are not\nsimple\u2014as is obvious from human history and the\nimmense tragedies that humans have endured ,as well\nas the successes we have realized. As global relation-\nships become even more intricately intertwined and\ncomplex,however, our survival becomes more depen-\ndent on empirically grounded scientific understanding.\nWe have not yet developed a behavioral theory of\ncollective action based on models of the individual\nconsistent with empirical evidence about how individ-\nuals make decisions in social-dilemma situations. A\nbehavioralcommitment to theory grounded in empir-\nical inquiry is essential if we are to understand such\nbasic questions as why face-to-face communication so\nconsistently enhances cooperation in social dilemmas\nor how structural variables facilitate or impede cffec-\ntive collective action.\n\nSocial dilemmas occur whenever individuals in inter-\ndependent situations face choices in which the maxi-\nmization of short-term

self-interest yields outcomes\nleaving all participants worse off than feasible alterna-\ntives. In a public-good dilemma, for example, all those\nwho would benefit from the provision of a public\ngood\u2014such as pollution control, radio broadcasts or\nweather forecasting\u2014find it costly to contribute and\nwould prefer others to pay for the good instead. If\neveryone follows the equilibrium strategy, then the\ngood is not provided or is underprovided Yet, every-\none would be better off if everyone were to contribute.\n\nSocial dilemmas are found in all aspects of life,\nleading to momentous decisions affecting war and\npeace as well as the mundane relationships of keeping\npromises in everyday life.Social dilemmas are called by\nmany names, including the public-good or collective-\ngood problem(Olson 1965, P. Samuelson 1954),shirk-\ning(Alchian and Demsetz 1972), the free-rider prob-\nlem(Edney 1979,Grossman and Hart 1980),moral\nhazard(Holmstrom 1982),the credible commitment\ndilemma(Williams, Collins, and Lichbach 1997), gen-\neralized social exchange (Ekch 1974; Emerson 1972a,\n\nYet, the theory of collective action is the central\nsubject of political science It is the core of the justifi-\ncation for the state. Collective-action problems per-\nvade international relations, face legislators when de-\nvising public budgets, permeate public bureaucracies,\nand are at the core of explanations of voting, interest\ngroup formation,and citizen control of governments in\na democracy. If political scientists do not have an\nempirically grounded theory of collective actio n,then\n\nElinor Ostrom is Arthur F.Bentley Professor of Political Science;\nCo-Director, Workshop in Political Theory and Policy Analysis;and\nCo-Director,Center for the Study of Institut ions,Population,and\nEnvironmental Change; Indiana Universtiy,Bloomington,IN 47408-\n3895.\n\nThe author gratefully acknowledges the support of the National\nScience Foundation(Grant #SBR-9319835 and SBR-9521918),the\nFord Foundation,the Bradley Foundation, and the MacArthur\nFoundation. My heartiest thanks go to James Alt Jose Apesteguia,\nPatrick Brandt, Kathryn Firmin-Sellers, Roy Gardner,Derek Kau-\nneckis, Fabrice Lehoucq.Margaret Levi, Thomas Lyon, Tony Mate-\njczyk, Mike McGinnis, Trudi Miller, John Orbell, Vincent Ostrom,\nEric Rasmusen David Schmidt, Sujai Shivakumar, Vernon Smith,\nCatherine Tucker, Gcorge Varughese, Jimmy Walker, John Wl-\nliams, Rick Wilson, Toshio Yamagishi,and Xin Zhang for their\ncomments on carlier drafts and to Patty Dalecki for all her excellent\neditorial and moralsupport.\n The term \u201ctragedy of the commons" refers to the proble that\ncommon-pool resources, such as oceans, lakes, forests, irrigation\nsystems, and grazing ands can easily be overused or destroyed if\nproperty rights to these resources are not well defined (sce Hardin\n1968).\n\n1\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\tA Behavioral Approach to the Rational Choice Theory of Collective Action_ Presidential Address, American Political Science Association, 1997 on JSTOR __ Reader View\n\tpage 2\n\tpage 3\n\tpage 4\n\tpage 5\n\tpage 6\n\tpage 7\n\tpage 8\n\tpage 9\n\tpage 10\n\tpage 11\n\tpage 12\n\tpage 13\n\tpage 14\n\tpage 15\n\tpage 16\n\tpage 17\n\tpage 18\n\tpage 19\n\tpage 20\n\tpage 21\n\tpage 22\n\n", "cloud_doc_url": null}]}, "recipient": "all", "channel": null}, "parent": "837a3eca-db76-4616-8636-0dc49cbf300a", "children": ["aaa2c4cb-861a-454b-94a5-683550ac8417"]}, "aaa2c4cb-861a-454b-94a5-683550ac8417": {"id": "aaa2c4cb-861a-454b-94a5-683550ac8417", "message": {"id": "aaa2c4cb-861a-454b-94a5-683550ac8417", "author": {"role": "user", "name": null, "metadata": {}}, "create_time": 1717446504.861403, "update_time": null, "content": {"content_type": "text", "parts": ["this isn't mentioned in the source cited. whats the source of this claim? "]}, "status": "finished_successfully", "end_turn": null, "weight": 1.0, "metadata": {"gizmo_id": "g-HTKib04fm",

"targeted_reply": "Sanpellegrino extracts millions of liters of water annually. For instance, in 2019, it was reported that Sanpellegrino's production facility in Val Brembana extracted approximately 3 million cubic meters of water\u200b", "request_id": "88e26decaabf0e63-MXP", "message_source": null, "timestamp_": "absolute", "message_type": null}, "recipient": "all", "channel": null}, "parent": "82b6e8c8-da40-4c2b-8f09-b40414b1dcf3", "children": ["e992ec72-8240-4a88-bf86-05082bfd55f0"]}, "e992ec72-8240-4a88-bf86-05082bfd55f0": {"id": "e992ec72-8240-4a88-bf86-05082bfd55f0", "message": {"id": "e992ec72-8240-4a88-bf86-05082bfd55f0", "author": {"role": "system", "name": null, "metadata": {}}, "create_time": 1717446504.861659, "update_time": null, "content": {"content_type": "text", "parts": [""]}, "status": "finished_successfully", "end_turn": null, "weight": 1.0, "metadata": {"request_id": "88e26decaabf0e63-MXP", "message_source": null, "timestamp_": "absolute", "message_type": null, "is_visually_hidden_from_conversation": true}, "recipient": "all", "channel": null}, "parent": "aaa2c4cb-861a-454b-94a5-683550ac8417", "children": ["c5e229ca-8379-4936-bc60-3e4ededa0954"]}, "c5e229ca-8379-4936-bc60-3e4ededa0954": {"id": "c5e229ca-8379-4936-bc60-3e4ededa0954", "message": {"id": "c5e229ca-8379-4936-bc60-3e4ededa0954", "author": {"role": "assistant", "name": null, "metadata": {}}, "create_time": 1717446548.297682, "update_time": null, "content": {"content_type": "code", "language": "unknown", "response_format_name": null, "text": "msearch(["Sanpellegrino water extraction statistics", "Sanpellegrino water extraction Val Brembana", "Sanpellegrino water usage 2019"])"}, "status": "finished_successfully", "end_turn": false, "weight": 1.0, "metadata": {"citations": [], "gizmo_id": "g-HTKibO4fm", "message_type": null, "model_slug": "gpt-4o", "default_model_slug": "gpt-4", "parent_id": "e992ec72-8240-4a88-bf86-05082bfd55f0", "finish_details": {"type": "stop", "stop_tokens": [200007]}, "is_complete": true, "request_id": "88e26decaabf0e63-MXP", "timestamp_": "absolute"}, "recipient": "myfiles_browser", "channel": null}, "parent": "e992ec72-8240-4a88-bf86-05082bfd55f0", "children": ["bf7b3c0b-2586-4022-8e00-92d81b4d42c2"]}, "bf7b3c0b-2586-4022-8e00-92d81b4d42c2": {"id": "bf7b3c0b-2586-4022-8e00-92d81b4d42c2", "message": {"id": "bf7b3c0b-2586-4022-8e00-92d81b4d42c2", "author": {"role": "tool", "name": "myfiles_browser", "metadata": {}}, "create_time": 1717446548.297742, "update_time": null, "content": {"content_type": "tether_browsing_display", "result": "# \u30100\u2020SRM DQ4.docx\u2020file-jrIPCdBup7OEovvS9tDvhMTh\u3011\nPart 2: What indicators are required to assess the systems dynamics of flow-limited resources? \nTo effectively assess the dynamics of flow-limited resources within a system a systems dynamics model must incorporate several key indicators. These indicators include stocks flows converters/constants and information flows each playing a crucial role in understanding and predicting system behaviors.\nStocks represent the quantities of resources available within the system at any given time. These could be tangible elements like water in a reservoir or abstract quantities such as carbon or even a population count in an ecological study. Stocks are foundational for monitoring resource levels and serve as a baseline for measuring changes over time (Reuter 2013)\nFlows describe the movement of resources between stocks or from external sources into the system. This includes inputs and outputs measured over specific time intervals such as liters of water per hour or tons of carbon per year. Understanding flows is critical for assessing how resources are utilized and replenished within the system providing insights into sustainability and efficiency (Reuter 2013).\nConverters/constants are parameters within the model that affect flows or stocks but remain unchanged regardless of system dynamics. These could include growth rate constants conversion efficiencies or fixed loss rates which are

essential for stabilizing the model and making accurate predictions (Reuter 2013).\nInformation flows represent the non-material connections that influence system components by altering flows or converters based on the state of stocks or other variables. This aspect of systems dynamics is crucial for modeling feedback mechanisms and adaptive behaviors within the system allowing for a more nuanced understanding of how changes in one part of the system can ripple through to others (Reuter 2013).\nBy integrating these components into a systems dynamics model it is possible to construct a comprehensive view of how resources are interlinked and governed by various dynamic factors. This holistic approach is vital for predicting future system states under different scenarios and for making informed decisions about resource management and conservation.\nWhat inputs might be incorporated into a model of flow-limited resources? How is this different from stock-limited resources? In resource management two distinct modeling approaches are used to predict and understand resource availability and sustainability: flow-limited and stock-limited models.\nFlow-limited models focus on the dynamics of resource renewal and consumption. These models consider key inputs like the rate at which a resource regenerates whether naturally or through human efforts. They also analyze the consumption rate to see how quickly the resource is being used by various entities or processes. Additionally factors like environmental conditions regulatory policies and technological changes play significant roles in influencing resource availability and flow. This model is dynamic adapting to changes in usage patterns and replenishment strategies providing a flexible framework for forecasting future resource statuses (Reuter 2013).\nIn contrast stock-limited models are concerned with the finite quantities of resources available. They focus on the absolute amount of the resource that exists or can be accessed such as fossil fuels or minerals. These models consider extraction or harvest rates detailing how quickly the resource is depleted over time. They also evaluate the resource\u2019s regeneration capabilities whether it can be naturally replenished or artificially sustained over long periods. This approach emphasizes the depletion of a fixed stock highlighting the limits of availability and the critical need for conservation and efficient use (Reuter 2013).\nThe main difference between these two models lies in their focus and application. Flow-limited models are dynamic reflecting continuous changes in resource flows and the effects of various influencing factors. They are particularly useful when resources can be renewed or are affected by external conditions. On the other hand stock-limited models deal with resources that have fixed availability concentrating on managing finite supplies and preventing exhaustion. Understanding these differences is crucial for policymakers businesses and conservationists. It helps in developing effective strategies for resource management ensuring sustainability and tackling the challenges posed by limited natural resources (Fisher 2020).\n# \u30101\u2020Regenerative Development and Design A Framework for Evolving Sustainability (Regenesis Group) (Z-Library).pdf\u2020file-RjsEjuCBjkNC51NlmGBPS5uW\u3011\nThe project was initially conceived as a fairly conventional demonstration site \nfor desert gardening. A turning point came when the Las Vegas Valley Water \nAuthority realized that it needed to shift its thinking from building a project \nthat was in the desert to building one that was of the desert. With this shift \nin attitude and perspective the design team, led by the Las Vegas firm LGA, \nbegan to create something that would serve as a regenerative force.\n\nAn interdisciplinary design team that included architects, landscape archi-\ntects, engineers, biologists, hydrologists, sustainability experts, and commu-\nnity stakeholders worked together to realize this vision. Much of the leadership

\n\n\n\nChapter 2 Understanding place 41\n\nwas provided by Patricia Mulroy of the Las Vegas Valley Water Authority. \nBefore accepting a position at the Brookings Institute, Mulroy had earned a \nnational reputation as the \u201cWater Witch of Las Vegas.\u201d As manager of all the \nwater resources for one of America\u2019s fastest growing cities, she demonstrated a \n\nfigure 2.3 An architectural rendering showing the layout of botanical and \n conservation gardens at Springs Preserve in Las Vegas, Nevada.\nCourtesy LGA\n\n\n\n42 part One Creating regenerative projects\n\n formidable grasp of the complexities and strategic challenges raised by intense \ndryland development in an age of climate change. Early on, she recognized that \nlife in a world of water scarcity was going to require more than technological \nsolutions. It was going to require the emergence of a new culture.\n\nAmong the land holdings of Mulroy\u2019s agency was a jewel hidden in plain \nsight\u2014180 acres in the heart of the city. The site housed a well field, stor-\nage tanks, and water treatment plant, and was surrounded by industrial \nneighborhoods. For generations it had served as a kind of open space, an \nunsupervised refuge for teenagers and young lovers. In the 1980s local pres-\nervationists had quietly worked with the water district to secure its historic \nstatus, but it remained dormant with regard to public engagement until the \nmid-1990s. The question was what to do with it.\n\nThe site contains a complex of artesian springs\u2014a true oasis in the desert. \nArchaeological evidence indicates an Anasazi presence in the area, followed \nby the southern Paiute for whom the springs were a major water source. The \nSpanish encountered the lush grasslands of this oasis and gave the area its \nname, Las Vegas, which means the meadows. It was a major campsite on the \nSpanish trail, which provided an east-west link to the far-flung Spanish empire \n\nfigure 2.4 The Desert Living Center and Sustainability Gallery at Springs Preserve.\nCourtesy LGA\n\n\n\nChapter 2 Understanding place 43\n\nin the American southwest. In the mid-nineteenth century, the Mormons set-\ntled the area just downstream of the springs. Later, the site became an impor-\ntant stop on the railroad that connected Salt Lake City to Los Angeles. At the \nbeginning of the twentieth century, developers from Los Angeles, in connec-\ntion with the railroads, finally established the city of Las Vegas (Figure 2.5).\n\nfigure 2.5 Botanical gardens at the Springs Preserve featuring local native plants.\nCourtesy LGA\n\nRecognizing that Las Vegas\u2019 water use was shortsighted, Mulroy knew that \nthis project needed to catalyze a shift in the city toward a culture of sustain-\nability. She encouraged the project team to engage in a planning process \nwhose focus was community development rather than site development. \nShe wanted to grow new capability within the water district, and that would \nrequire bringing together a larger than usual circle of stakeholders.\n# \u30102\u2020Regenerative Development and Design A Framework for Evolving Sustainability (Regenesis Group) (Z-Library).pdf\u2020file-RjsEjuCBjkNC51NlmGBPS5uW\u3011\nin Baltimore Harbor project, 163\u2013165, 163f\u2013165f\nin Curitiba, Brazil, 69\n\nTrees, value added by, 17\u201318, 18f\nTucson, Arizona, 119\u2013122, 120f, 121f\nTurtle sanctuary (Playa Viva Resort), 6, 6f\nTuxtla Guti\u00e9rrez, Mexico, 169\u2013172, 170f\n\nU\nUncertainty, 201\nUnderstanding, 150\u2013151\nUNESCO, 158\nUniformity, manageable, 70\nUnintended consequences, law of, 153\nUniqueness:\n\nand conventional sustainability planning, 61\nrespecting, 195\ntalent vs., 124\u2013125\n\nUnited Nations, xxiv, 96\nU.S. Forest Service, 145, 146, 148, 149, 152\nU.S. Green Building Council, 40\nUniversity of Las Vegas DesertSol Solar House, 40\nUniversity of New Mexico School of Architecture \n\nand Planning, 184\nUnpredictability, 21\nUrban acupuncture, 156, 167\n\nUrban design, 24\nUrban ecology, cities in, 158\nUrban Garden

(theme), 105\nUrbanism, 65\u201367, 167\nUrban Learning Group, xxii\nUrban metabolism school, 158\nUsers, in design process, 103\n\nV\nValley Yokut tribe, xxvii\nValue(s):\n\nadding, see Adding value\nincreasing capacity to generate, 30\u201331\nof restraints, 131\nsharing project\u2019s, 194\u2013195\n\nValue added (term), 139\nValue-adding roles:\n\nand conceptualization in regenerative develop-\nment, 142\u2013144\n\nand goals of regenerative projects, 137\u2013138\nfor Living Rooms at the Border project, 25\nfor Middle Kyle Canyon project, 145\u2013150, 147f\nin natural systems, 140\u2013142\nof regenerative projects, 138\u2013144\n\nVancouver, British Columbia, 104\u2013110, 104f, 106f\nVan der Ryn, Sim, v\u2013vi\nVermont, 25\u201329, 26f, 28f, 31\nViability, value creation and, 17\u201318\nVillafranca, Raul de, 73\u201376, 78, 97\u2013100\nVi\u00f1a del Mar, Chile, 189\u2013192, 190f\u2013191f\nVirtuous cycles, 18\nVitalization, from energy fields, 206\u2013207\nVocation(s), 61\u201379\n\napplying, to design, 77\u201379\nin Curitiba, Brazil, 64\u201369\nin El Jobo project, 73\u201376\nnested, 72\u201373\nin regenerative development, 62\u201364\nas source of direction, 62\u201364, 69\u201370, 78\u201379\nsustainability as byproduct of, 62\n\nVocation of place:\ndirection from, 78\u201379\ndiscovering, 77\u201378\nin El Jobo project, 73\u201377\nin regenerative development, 70\u201372\n\nW\nWahl, Daniel, 45\nWaldrop, Mitchell, 16\nWalker, Stuart, vii\nWaterfront Partnership of Baltimore, 162, 163\n\n\n\nIndex 235\n\nWater quality, poverty and, 166\nWater stress, xxi\nWater use, at Springs Preserve, 40\u201343\nWealth, 94\u201397\n\nin complex systems, 21\nand direction, 70\nfive capitals framework of, 95\u201397, 96f\n# \u30103\u2020SRM DQ4.docx\u2020file-jrIPCdBup7OEovvS9tDvhMTh\u3011\nWhat inputs might be incorporated into a model of flow-limited resources? How is this different from stock-limited resources? In resource management two distinct modeling approaches are used to predict and understand resource availability and sustainability: flow-limited and stock-limited models.\nFlow-limited models focus on the dynamics of resource renewal and consumption. These models consider key inputs like the rate at which a resource regenerates whether naturally or through human efforts. They also analyze the consumption rate to see how quickly the resource is being used by various entities or processes. Additionally factors like environmental conditions regulatory policies and technological changes play significant roles in influencing resource availability and flow. This model is dynamic adapting to changes in usage patterns and replenishment strategies providing a flexible framework for forecasting future resource statuses (Reuter 2013).\nIn contrast stock-limited models are concerned with the finite quantities of resources available. They focus on the absolute amount of the resource that exists or can be accessed such as fossil fuels or minerals. These models consider extraction or harvest rates detailing how quickly the resource is depleted over time. They also evaluate the resource\u2019s regeneration capabilities whether it can be naturally replenished or artificially sustained over long periods. This approach emphasizes the depletion of a fixed stock highlighting the limits of availability and the critical need for conservation and efficient use (Reuter 2013).\nThe main difference between these two models lies in their focus and application. Flow-limited models are dynamic reflecting continuous changes in resource flows and the effects of various influencing factors. They are particularly useful when resources can be renewed or are affected by external conditions. On the other hand stock-limited models deal with resources that have fixed availability concentrating on managing finite supplies and preventing exhaustion. Understanding these differences is crucial for policymakers businesses and conservationists. It helps in developing effective strategies for resource management

ensuring sustainability and tackling the challenges posed by limited natural resources (Fisher 2020).\nProvide an example of the systems dynamics of:\nA stock-limited resource (such as cobalt)\nA flow-limited resource (such as rabbits)\nDescribe what and how you would measure the inputs outputs and feedback loops (in-flow out-flow connectors or dependencies stocks and sources or sinks) in each example. Keep it simple (i.e. bamboo production for chairs). You don\u2019t have to do the mathematical calculations just describe the systems process. (If you want to take it further you can use Stella Online Modeling linked above).\n# \u30104\u2020Regenerative Development and Design A Framework for Evolving Sustainability (Regenesis Group) (Z-Library).pdf\u2020file-RjsEjuCBjkNC51NlmGBPS5uW\u3011\nFor water harvesting expert Brad Lancaster, rain has never been a prob-\nlem. Over the years, he has converted his once barren neighborhood of \nDunbar/Spring in Tucson, Arizona, into a leafy refuge from the hot desert sun \n(Figures 5.2A and B). Beginning with his own property, Lancaster diverted \nstreet and sidewalk runoff into swales planted with food-bearing, native trees \n(Figure 5.3). The results were so impressive that his neighbors soon followed \nsuit. As a result, the neighborhood created a new identity for itself. From a \n\n\n\n120 part two Creating regenerative processes\n\nsketchy reputation as a formerly segregated and then downtrodden and \ncrime-ridden place, it was transformed to a proud example of how to live well \nin the desert southwest.\n\nfigure 5.2a A street in the Dunbar/Spring neighborhood of \nTucson, Arizona, in 1994, before swales were dug and food-\nbearing trees were planted. \nCopyright \u00a9 Brad Lancaster. Reproduced with permission from \nRainwater Harvesting for Drylands and Beyond by Brad Lancaster.\n\nfigure 5.2B The same street in 2006\u2014a representative image \nof transformation throughout the neighborhood. \nCopyright \u00a9 Brad Lancaster. Reproduced with permission from \n Rainwater Harvesting for Drylands and Beyond by Brad Lancaster.\n\n\n\nChapter 5 Start from potential 121\n\nAs Lancaster recalls:\n\nThe tree planting enabled the people of the neighborhood to come \ntogether\u2014new and old residents, alike\u2014around a shared and worthy \npurpose. What made it significant is that we emphasized water harvest-\ning before tree planting. That set us apart. Lots of communities are plant-\ning trees, but the rainwater piece took it to another level because we \nweren\u2019t contributing to the extraction of groundwater. Then we began \nto host an annual festival that featured native foods harvested from the \ntrees right here in the neighborhood (Figures 5.4 and 5.5). This attracted \na lot of visitors and set an example for the city, which started to embrace \nour pioneering innovations as public policy.6\n\nWhen the neighborhood was awarded a half-million-dollar improvement \ngrant, residents decided to dedicate the funds to water harvesting, traffic \ncalming, tree planting, and public art that told their story. Money for resources \nand labor enabled elderly people and others to participate. What had been \nan exciting but cutting-edge project had now become the neighborhood \nnorm, deeply embedded into its identity.7\n\nfigure 5.3 In the Dunbar/Spring neighborhood, a newly \nconstructed water-harvesting chicane (basin) along a bicycle \nboulevard is filled with rainwater after a summer storm. \n\nCopyright \u00a9 Brad Lancaster. Reproduced with permission from \nRainwater Harvesting for Drylands and Beyond by Brad Lancaster.\n\n\n\n122 part two Creating regenerative processes\n\nfigure 5.4 A mobile hammermill grinds neighborhood-grown-and-harvested \nmesquite pods into edible flour. \nCopyright \u00a9 Brad Lancaster. Reproduced with permission from \n Rainwater Harvesting for Drylands and Beyond by Brad Lancaster.\n\nfigure 5.5 Everyone is invited to participate in the neighborhood prickly \npear harvest! \nCopyright \u00a9 Brad Lancaster. Reproduced with permission

from \n Rainwater Harvesting for Drylands and Beyond by Brad Lancaster.\n\n\n\nChapter 5 Start from potential 123\n\nPotential iS inherent\n\nOne way to characterize living systems is that each is distinctive, with an \nessence that is the source of its uniqueness. This perspective can be applied \nat any scale, whether the living system is a tree or a forest, a person or a city. \nRegenerative potential arises from this distinctive core character.\n# \u30105\u2020SRM DQ4.docx\u2020file-jrIPCdBup7OEovvS9tDvhMTh\u3011\nPart 1: What are the three dimensions of improvement in Life Cycle Sustainability Assessment suggested in the reading? Describe why these are important and relate and apply the three dimensions to your learning from earlier modules.According to Onat et al. (2017) three key dimensions of improvement are suggested to enhance the effectiveness of sustainability assessments. These dimensions include the integration of environmental economic and social dimensions the application of systems thinking and the active engagement of stakeholders. Each of these elements is vital for constructing a holistic and effective approach to sustainability that transcends the limitations often imposed by capitalist systems which typically prioritize profit at the expense of environmental and social equity.\nThe overall approach to sustainability presented by Onat et al. (2017) emphasizes the necessity of considering the environmental economic and social impacts of products or services throughout their lifecycle. It stands in contrast to and challenges the capitalist tendency to focus solely on economic gains by highlighting the interconnectedness of these dimensions. Ignoring any of these aspects can lead to solutions that might appear beneficial in one area but are detrimental in others.Systems thinking requires understanding the complete lifecycle of a product or service\u2014from raw material extraction to disposal\u2014and identifying potential impacts at each stage. This method helps in pinpointing critical points for intervention and prevents unintended consequences that could arise from changes made in isolation. One can clearly see the links between systems thinking and the ideas presented by Ostrum (1997) which expands the rational choice models to incorporate collective actions that better address complex social dilemmas. It challenges simplistic linear thinking\u2014common in capitalist approaches\u2014that often overlook long-term consequences for immediate profit.\nFinally engaging stakeholders across the lifecycle of a product or service ensures that the diverse values and needs of different groups are considered and addressed in the sustainability assessment process. This approach is crucial for democratizing decision-making processes which often are controlled top-down in capitalist structures. Fisher\u2019s (2020) discussions on how system dynamics modeling can involve stakeholders in understanding and managing complex systems effectively provide a solid argument for stakeholder engagement across the lifecycle. \nBy applying these three dimensions to the broader discussions from earlier modules it becomes evident how these principles can help counteract the equity and sustainability challenges exacerbated by capitalist systems. These dimensions advocate for a more inclusive holistic and long-term approach to sustainability that aligns with social equity and environmental stewardship rather than focusing narrowly on immediate economic outcomes. This integrated approach not only critiques but actively challenges the inequities perpetuated by capitalist systems paving the way for more sustainable and equitable global practices.\n\nPart 2: What indicators are required to assess the systems dynamics of flow-limited resources? \nTo effectively assess the dynamics of flow-limited resources within a system a systems dynamics model must incorporate several key indicators. These indicators include stocks flows converters/constants and information flows each playing a crucial

role in understanding and predicting system behaviors.\nStocks represent the quantities of resources available within the system at any given time. These could be tangible elements like water in a reservoir or abstract quantities such as carbon or even a population count in an ecological study. Stocks are foundational for monitoring resource levels and serve as a baseline for measuring changes over time (Reuter 2013)\nFlows describe the movement of resources between stocks or from external sources into the system. This includes inputs and outputs measured over specific time intervals such as liters of water per hour or tons of carbon per year. Understanding flows is critical for assessing how resources are utilized and replenished within the system providing insights into sustainability and efficiency (Reuter 2013).\nConverters/constants are parameters within the model that affect flows or stocks but remain unchanged regardless of system dynamics. These could include growth rate constants conversion efficiencies or fixed loss rates which are essential for stabilizing the model and making accurate predictions (Reuter 2013).\nInformation flows represent the non-material connections that influence system components by altering flows or converters based on the state of stocks or other variables.\n# \u30106\u2020Regenerative Development and Design A Framework for Evolving Sustainability (Regenesis Group) (Z-Library).pdf\u2020file-RjsEjuCBjkNC51NlmGBPS5uW\u3011\nBecause partnership is relational, it moves us beyond the paternalism of pro-\ntection and preservation. Conservationist Peter Forbes has noted that:\n\n. . . 42 percent of the private land in America is posted No Trespassing. \nAnd nearly 80 percent of land \u201cprotected\u201d by private conservation orga-\nnizations is posted No Trespassing. . . . Saving land while losing human \nunderstanding of the land, what lives there, why it needs to be part of \nour lives, what it has meant throughout history is to create conflict. . . . \nAs a nation and as a movement, we\u2019ve spent too much time separating \n\n\n\n40 part One Creating regenerative projects\n\npeople and the land and precious little time being in dialogue about \nwhat defines a healthy relationship between the two.10\n\nrenewing The sourCe\n\nThe award-winning Springs Preserve in Las Vegas, Nevada, is an example of \nwhat can result when a design focus shifts from preserving to partnering. The \npreserve is a unique natural area located in the historic heart of Las Vegas, \nNevada. It includes a Desert Living Center and Sustainability Gallery, the \nNevada State Museum, Origen Museum, the University of Las Vegas DesertSol \nSolar House, a butterfly habitat, botanical and conservation gardens, a recre-\nated spring pool, and extensive trails. It also houses a reservoir and pumping \nstation that delivers potable water to much of the metropolitan area. The site \nis important archaeologically, historically, and culturally (Figures 2.3 and 2.4).\n\nAn abundance of sustainable and appropriate technologies integrate the \npreserve into the hot dry climate of the Mojave Desert. Passive solar design, \nrammed earth and straw bale construction, biological wastewater treatment, \ngrid-tied photovoltaics, protection of archaeological and biological resources, \nand native plant landscaping have all contributed to earning it a platinum cer-\ntification from the U.S. Green Building Council\u2019s LEED program. Equally impor-\ntant, the project is locally beloved and has become one of the city\u2019s most \npopular destinations. Las Vegas residents come to the preserve to learn how \nto incorporate water conservation and sustainable practices into their daily \nlives. In this way, it has positioned itself as an advocate, promoting conserva-\ntion and appreciation of the desert environment as a special place to live.\n\nThe project was initially conceived as a fairly conventional demonstration site \nfor desert gardening. A turning point came when the Las Vegas

Valley Water \nAuthority realized that it needed to shift its thinking from building a project \nthat was in the desert to building one that was of the desert. With this shift \nin attitude and perspective the design team, led by the Las Vegas firm LGA, \nbegan to create something that would serve as a regenerative force.\n\nAn interdisciplinary design team that included architects, landscape archi-\ntects, engineers, biologists, hydrologists, sustainability experts, and commu-\nnity stakeholders worked together to realize this vision. Much of the leadership \n\n\n\nChapter 2 Understanding place 41\n\nwas provided by Patricia Mulroy of the Las Vegas Valley Water Authority. \nBefore accepting a position at the Brookings Institute, Mulroy had earned a \nnational reputation as the \u201cWater Witch of Las Vegas.\u201d As manager of all the \nwater resources for one of America\u2019s fastest growing cities, she demonstrated a \n\nfigure 2.3 An architectural rendering showing the layout of botanical and \n conservation gardens at Springs Preserve in Las Vegas, Nevada.\nCourtesy LGA\n\n\n\n42 part One Creating regenerative projects\n# \u30107\u2020Regenerative Development and Design A Framework for Evolving Sustainability (Regenesis Group) (Z-Library).pdf\u2020file-RjsEjuCBjkNC51NlmGBPS5uW\u3011\nVancouver, British Columbia, 104\u2013110, 104f, 106f\nVan der Ryn, Sim, v\u2013vi\nVermont, 25\u201329, 26f, 28f, 31\nViability, value creation and, 17\u201318\nVillafranca, Raul de, 73\u201376, 78, 97\u2013100\nVi\u00f1a del Mar, Chile, 189\u2013192, 190f\u2013191f\nVirtuous cycles, 18\nVitalization, from energy fields, 206\u2013207\nVocation(s), 61\u201379\n\napplying, to design, 77\u201379\nin Curitiba, Brazil, 64\u201369\nin El Jobo project, 73\u201376\nnested, 72\u201373\nin regenerative development, 62\u201364\nas source of direction, 62\u201364, 69\u201370, 78\u201379\nsustainability as byproduct of, 62\n\nVocation of place:\ndirection from, 78\u201379\ndiscovering, 77\u201378\nin El Jobo project, 73\u201377\nin regenerative development, 70\u201372\n\nW\nWahl, Daniel, 45\nWaldrop, Mitchell, 16\nWalker, Stuart, vii\nWaterfront Partnership of Baltimore, 162, 163\n\n\n\nIndex 235\n\nWater quality, poverty and, 166\nWater stress, xxi\nWater use, at Springs Preserve, 40\u201343\nWealth, 94\u201397\n\nin complex systems, 21\nand direction, 70\nfive capitals framework of, 95\u201397, 96f\n\nWeb of life, 156\nWeil, Simone, 38\nWell-being, genuine wealth and, 95\nWestchester, New York, housing project in, \n\n143\u2013144\nWestern Cape, South Africa, 85\u201386\nWestern cultures:\n\natomizing bias in, 207\nthinking patterns in, 208\u2013210\n\nWetlands platforms, 163\u2013165, 163f\u2013165f\n\u201cWhat kind of here is this?\u201d question, 58\u201359\nWheatley, Meg, 210\nWhole Foods, 27\nWildcat, Daniel, xix, xxxii\nWilderness, 39\nWildlife corridors, 82, 83f\n\nWill:\nand agency, in regenerative development, \n\nxiv\u2013xv\nleveraging of, 68\u201369\nand potential, 135\nin regenerative development, 182\n\nWindham and Windsor Housing Trust, 25\nWorking from potential:\n\nDunbar/Spring stormwater management \nproject, 119\u2013122\n\nin regenerative development, 117\u2013119\nWork in progress, being, 211\u2013212\n\nY\nYellowstone National Park, 140\u2013142, 141f, 151, 156\nYield, maximum vs. optimal, 70\nYsidro Sin Limites workshops, 23\nYucatan peninsula, 47\u201348\n\nZ\nZari, Maibritt Pedersen, xxvii\nZoning, 23, 180\n\n\n\nWILEY END USER LICENSE\nAGREEMENT\n\nGo to www.wiley.com/go/eula to access Wiley\u2019s ebook\nEULA.\n\nhttp://www.wiley.com/go/eula\n\n\tRegenerative Development and Design: A Framework for Evolving Sustainability\n\tContents\n\tForeword\n\tAcknowledgments\n\tChanging Our Minds\n\tRegenerative Development\n\tWe Are All Designers\n\tAn Invitation\n\tEndnote\n\n\tThe Future of Sustainability\n\tA Growing Need for

Integration\n\tWhat Is Sustainability\u2014Really?\n\tTwo Models of Nature\n\tThe Changing Meaning of Sustainability\n# \u30108\u2020v7-Rueter-chap6.pdf\u2020file-BvI6FLrOlLhn5vrhKoySqbmO\u3011\n130 August 13, 2013 \n\n \n\n \n\n \n\nChapter 6 \u2013 Stock and Flow Systems \n \n6.1 Introduction \nEcological, geochemical and human processes can be described by \nfollowing the flows of material or energy from one place or form \nto another. A "system" is any set of connected processes and \nquantities of resources. It can be as larger or as small as you want \nto set the boundaries around. Although some people use the term \n"systems approach" to be holistic and inclusive, our use of the \nword "systems view" specifies a set of intellectual tools that can be \napplied to any size set of processes and resources. \n\nThis text presents one specific definition of how to characterize an \nenvironmental problem as a system of stocks and flows. We will \nbe using a limited list of characteristics of a system that can be \nused to describe many different structures and behaviors. Our \nconstrained set of categories will help highlight the structural \nsimilarities and differences between different systems. \n\nThis "systems" approach is useful for simplifying problems, \nlooking for significant processes and identifying controls. The \napproach can also be used to create simulations of future \nconditions and to communicate these to other people who are \nmaking decisions. Another of the benefits of this approach is that it \nclearly identifies the assumptions on which simulations are based. \nA good "systems" model is both a valuable research tool and a \nplatform for communication and decision-making. Thus, carefully \ngathering information to construct a stock and flow description of \nan environmental problem is a good example of methodically \ncollecting information that takes place in scientific research (Pielke \n2007). \n\n\n\nDraft v7 131 \n\n \n6.2 Model Components \nThere are five components that we will use to represent the \nstructure and behavior of our chosen system: stocks, flows, \ninformation flows, convertors/constants and a source/sink. An icon \nrepresents each component. For example, look at the growth of a \npopulation of rabbits (see Figure 1). \n\n \n\nFigure 6-1. A simple systems diagram for the increase in a population of rabbits \nillustrates the five objects that we will use. \nStocks are a quantity of something. Water in a tank is a good \nexample of a stock. Sometimes stocks are called reservoirs. All the \nstocks that are connected with flows will have the same units, that \nis all the stocks will be a quantity of water, or an amount of carbon, \nor the number of people, etc. In our example, the stock is the \n\n\n\n132 August 13, 2013 \n\n \n\nnumber of rabbits in the population. We represent this in a systems \ndiagram with a box icon. \n\nA source or sink is either has an unlimited, unchanging \nconcentration or a reservoir that is outside the boundaries of the \nsystem that we are studying. In our example, the source of new \nmatter that supports rabbit growth is not being considered. You can \nimagine another model where the amount of food available to the \nrabbit population limited the amount of new rabbits being born. In \nthis case, we would probably model the system to include the \nnutrients as a stock rather than a source/sink. A source/sink is \nrepresented as a little cloud in our diagrams. \n\nFlows connect stocks or source/sinks. The flow will increase any \nstock that it flows into or decrease a stock that it flows out of. All \nthe flows that are connected to a stock will have the units of \nwhatever the units of the stocks are per time. For example this \ncould be liters of water per hour, tons of carbon per year, or in our \nexample, rabbits per month.\n# \u30109\u2020Regenerative Development and Design A Framework for Evolving Sustainability (Regenesis Group) (Z-Library).pdf\u2020file-RjsEjuCBjkNC51NlmGBPS5uW\u3011\nThe site contains a complex of

artesian springs\u2014a true oasis in the desert. \nArchaeological evidence indicates an Anasazi presence in the area, followed \nby the southern Paiute for whom the springs were a major water source. The \nSpanish encountered the lush grasslands of this oasis and gave the area its \nname, Las Vegas, which means the meadows. It was a major campsite on the \nSpanish trail, which provided an east-west link to the far-flung Spanish empire \n\nfigure 2.4 The Desert Living Center and Sustainability Gallery at Springs Preserve.\nCourtesy LGA\n\n\nChapter 2 Understanding place 43\n\nin the American southwest. In the mid-nineteenth century, the Mormons set-\ntled the area just downstream of the springs. Later, the site became an impor-\ntant stop on the railroad that connected Salt Lake City to Los Angeles. At the \nbeginning of the twentieth century, developers from Los Angeles, in connec-\ntion with the railroads, finally established the city of Las Vegas (Figure 2.5).\n\nfigure 2.5 Botanical gardens at the Springs Preserve featuring local native plants.\nCourtesy LGA\n\nRecognizing that Las Vegas\u2019 water use was shortsighted, Mulroy knew that \nthis project needed to catalyze a shift in the city toward a culture of sustain-\nability. She encouraged the project team to engage in a planning process \nwhose focus was community development rather than site development. \nShe wanted to grow new capability within the water district, and that would \nrequire bringing together a larger than usual circle of stakeholders.\n\nThe team very quickly uncovered a profound conflict. Some wanted to pre-\nserve the site and its wealth of archeological and biological resources, while \nothers wanted to open it to visitors and provide them with interpretation of \nthese resources. This conflict was eventually reconciled by highlighting the \nhistorical and cultural significance of the site to the region as a whole. All par-\nties agreed that the best way to preserve precious resources was to influence \nthe way people live in this place.\n\n\n44 part One Creating regenerative projects\n\nAnchoring the project in place, making it of the desert, eventually influenced the \ndesign and building of all of its components. Every one of them was prohibited \nby Las Vegas\u2019 existing land use and building codes, but what was trying to come \nto be on the site was compelling and self-evidently appropriate. This led the vari-\nous government agencies involved to adopt new codes that allowed building to \ngo forward. Subcontractors were so proud of their participation that they would \noften sneak their families onto the construction site after hours. They knew that \nthey were not just building structures; they were building community. Even \nbefore ground was broken, the project began to earn public affection and enthu-\nsiasm because it brought people into partnership with their history and ecology.\n\nWhen the Springs Preserve opened its doors in 2007, its features and loca-\ntion attracted national attention. A visionary ecological project was so unlike \nthe associations that most of the public have with Las Vegas\u2014a neon play-\nground for nightlife and high-stakes gambling\u2014that people couldn\u2019t help but \nobserve, \u201cIf it can happen here, it can happen anywhere!\u201d This was one time \nwhen what happened in Las Vegas didn\u2019t need to stay in Las Vegas (Figure 2.6).\n\nfigure 2.6 An aerial view of Springs Preserve in the construction phase, showing \nits location within the city in relation to the downtown strip.\n\nCourtesy LGA\n\n\n\nChapter 2 Understanding place 45\n\nPlaCe as living sysTem\n# \u301010\u2020tactiq-free-transcript-IoRjz8iTVoo.txt\u2020file-QAdtwx5q5xmFsPgGvYJdRiuF\u3011\n00:07:06.000 And if we remember Sheikh Yamani when he formed OPEC,\n00:07:09.000 they asked him, "When will we see the end of the age of oil?"\n00:07:12.000 I don't know if you remember his answer, but it was,\n00:07:15.000 "The Stone Age didn't end because we ran out of

stones."\n00:07:19.000 We see that companies acting ethically in this world\n00:07:23.000 are outperforming those that don't.\n00:07:24.000 We see the flows of materials in a rather terrifying prospect.\n00:07:29.000 This is a hospital monitor from Los Angeles, sent to China.\n00:07:32.000 This woman will expose herself to toxic phosphorous,\n00:07:35.000 release four pounds of toxic lead into her childrens' environment,\n00:07:38.000 which is from copper.\n00:07:40.000 On the other hand, we see great signs of hope.\n00:07:42.000 Here's Dr. Venkataswamy in India, who's figured out\n00:07:45.000 how to do mass-produced health.\n00:07:47.000 He has given eyesight to two million people for free.\n00:07:51.000 We see in our material flows that car steels don't become car steel again\n00:07:54.000 because of the contaminants of the coatings --\n00:07:56.000 bismuth, antimony, copper and so on.\n00:07:58.000 They become building steel.\n00:07:59.000 On the other hand, we're working with Berkshire Hathaway,\n00:08:01.000 Warren Buffett and Shaw Carpet,\n00:08:04.000 the largest carpet company in the world.\n00:08:05.000 We've developed a carpet that is continuously recyclable,\n00:08:08.000 down to the parts per million.\n00:08:11.000 The upper is Nylon 6 that can go back to caprolactam,\n00:08:14.000 the bottom, a polyolephine -- infinitely recyclable thermoplastic.\n00:08:17.000 Now if I was a bird, the building on my left is a liability.\n00:08:21.000 The building on my right, which is our corporate campus for The Gap\n00:08:24.000 with an ancient meadow, is an asset -- its nesting grounds.\n00:08:29.000 Here's where I come from. I grew up in Hong Kong,\n00:08:31.000 with six million people in 40 square miles.\n00:08:33.000 During the dry season, we had four hours of water every fourth day.\n00:08:37.000 And the relationship to landscape was that of farmers who have been\n00:08:40.000 farming the same piece of ground for 40 centuries.\n00:08:44.000 You can't farm the same piece of ground for 40 centuries\n00:08:46.000 without understanding nutrient flow.\n00:08:49.000 My childhood summers were in the Puget Sound of Washington,\n00:08:52.000 among the first growth and big growth.\n00:08:54.000 My grandfather had been a lumberjack in the Olympics,\n00:08:56.000 so I have a lot of tree karma I am working off.\n# \u301011\u2020tactiq-free-transcript-IoRjz8iTVoo.txt\u2020file-QAdtwx5q5xmFsPgGvYJdRiuF\u3011\n00:06:01.000 (Applause)\n00:06:04.000 What don't you like about this?\n00:06:07.000 Which part of this don't you like?\n00:06:09.000 So we realized we want full diversity,\n00:06:11.000 even though it can be difficult to remember what De Gaulle said\n00:06:14.000 when asked what it was like to be President of France.\n00:06:16.000 He said, "What do you think it's like trying to run a country with 400 kinds of cheese?"\n00:06:20.000 But at the same time, we realize that our products are not safe and healthy.\n00:06:23.000 So we've designed products\n00:06:25.000 and we analyzed chemicals down to the parts per million.\n00:06:27.000 This is a baby blanket by Pendleton that will give your child nutrition\n00:06:30.000 instead of Alzheimer's later in life.\n00:06:32.000 We can ask ourselves, what is justice,\n00:06:34.000 and is justice blind, or is justice blindness?\n00:06:38.000 And at what point did that uniform turn from white to black?\n00:06:43.000 Water has been declared a human right by the United Nations.\n00:06:46.000 Air quality is an obvious thing to anyone who breathes.\n00:06:48.000 Is there anybody here who doesn't breathe?\n00:06:51.000 Clean soil is a critical problem -- the nitrification, the dead zones\n00:06:54.000 in the Gulf of Mexico.\n00:06:56.000 A fundamental issue that's not being addressed.\n00:06:58.000 We've seen the first form of solar energy\n00:07:00.000

that's beat the hegemony of fossil fuels in the form of wind\n00:07:03.000 here in the Great Plains, and so that hegemony is leaving.\n00:07:06.000 And if we remember Sheikh Yamani when he formed OPEC,\n00:07:09.000 they asked him, "When will we see the end of the age of oil?"\n00:07:12.000 I don't know if you remember his answer, but it was,\n00:07:15.000 "The Stone Age didn't end because we ran out of stones."\n00:07:19.000 We see that companies acting ethically in this world\n00:07:23.000 are outperforming those that don't.\n00:07:24.000 We see the flows of materials in a rather terrifying prospect.\n00:07:29.000 This is a hospital monitor from Los Angeles, sent to China.\n00:07:32.000 This woman will expose herself to toxic phosphorous,\n00:07:35.000 release four pounds of toxic lead into her childrens' environment,\n00:07:38.000 which is from copper.\n00:07:40.000 On the other hand, we see great signs of hope.\n00:07:42.000 Here's Dr. Venkataswamy in India, who's figured out\n00:07:45.000 how to do mass-produced health.\n00:07:47.000 He has given eyesight to two million people for free.\n00:07:51.000 We see in our material flows that car steels don't become car steel again\n00:07:54.000 because of the contaminants of the coatings --\n00:07:56.000 bismuth, antimony, copper and so on.\n00:07:58.000 They become building steel.\n#\u301012\u2020v7-Rueter-chap6.pdf\u2020file-BvI6FLr0lLhn5vrhKoySqbm0\u3011\nDraft v7 149 \n\n \n\n \nFigure 6-12. The mechanisms of harvest can have a negative effect on the \nconditions for growth. Overharvest can damage the microenvironment necessary \nfor optimal growth. \n\n \n\nAnother important issue with natural resource management is the \nimpact of bad (or good) luck. What if you were managing a forest \nthat had an average growth rate but there was a single drought year \nthat decreased the input to the resource by 50% just for that year? \nIf you had a harvest plan that was even just 5% more than the \nactual maximum yield you could harvest, it would lead to a \ndecrease in the population that would never recover (assuming you \ndon't stop harvesting after you see the population start to crash). \n\n \n\n \n \n\nFigure 6-13. Conditions might also vary with time, such as a year of drought or \nunhealthy water. \n\n \n\n\n\n150 August 13, 2013 \n\n \n\nThe effect of one bad year (only 50% output) and an underestimate \nof true maximum yield by only 5%. In 100 years you're down to \nless than 1/3 of your starting natural capital. \n\n \n \nFigure 6-14. With just one bad year, holding to the previous \u201cmaximum \nsustainable yield\u201d will eventually cause the collapse of this resource. \n\n \n\n\nUsing this simple model of natural capital and sustainability \nillustrates that there are at least three ways to destroy the \nsustainability of your natural capital \n\na. simple overharvest, but this may be because you didn't \nhave good estimates for the maximum yield \nb. indirect effects from either harvest methods or use \nc. risk of being too close to the maximum yield, one bad \nyear and the resource declines dramatically \n\n \n6.9 Case Study: Population and Environment of \nEaster Island, Rapa Nui \n\n\n\nDraft v7 151 \n\n \n\n Easter Island (also known as Rapa Nui) is a small island in the \nmiddle of a very large ocean. The area of the island is only 166 \nkm^2 (64 mi^2) and it is 2250 km from the nearest other island \n(Pitcairn Island) and over 3700 km from South America, the \nnearest continent. You have undoubtedly heard something about \nthis fascinating island related to speculations on what caused the \npopulation to crash. In fact, you've probably heard more about this \nisland because of this failure to be sustainable than you've heard \nabout any of the myriad of other islands in the South Pacific. \n\nAt one time in the history of this island, the society had fairly \nsophisticated culture and technology. The cultural history describes \na well-developed hierarchy with laws and written

script. The \nevidence of the technology was their ability to move the large \nstone statues, which the island is most known for, for long \ndistances. They moved carved stone sculptures that weighed up to \n82 tons as far as six miles (10 km). The islanders cultivated a large \npart of the island with multiple crops. Estimates of the maximum \npopulation on the island ranged from 7,000 to as high as 20,000. \nAnd yet the population and civilization must have crashed. When \nEuropean boats first recorded their interaction with the island (in \nthe 1700s) the population was only several thousand, and these \npeople were leading a tough life in an impoverished and desolate \nenvironment.\n# \u301013\u2020tactiq-free-transcript-QBrmAGcMIi8.txt\u2020file-vvb9NyR3FuX2dGLwwPp6qTvx\u3011\n440 water flowing in\n00:03:18.560 at a constant rate using the sd\n00:03:21.760 structure the initial\n00:03:25.280 water in the lake would be placed in a\n00:03:27.840 stock icon\n00:03:29.200 and it would only have an\n00:03:32.239 inflow since it is only increasing\n00:03:35.599 with a constant value in the flow we\n00:03:38.799 know the behavior of the stock\n00:03:40.640 is growing linearly since the rate of\n00:03:42.799 change is constant\n00:03:44.319 and positive the sd\n00:03:47.360 software calculates the value of the\n00:03:49.360 stock using recursion which is shown in\n00:03:52.000 the table at the left\n00:03:53.599 we see that the flow value is added to\n00:03:56.239 the current value of the stock\n00:03:58.080 each time unit now we see the\n00:04:00.640 traditional closed form equation for the\n00:04:02.720 linear function where w\n00:04:04.560 represents the amount of water in the\n00:04:07.439 lake\n00:04:08.400 it starts at 100 units and grows at five\n00:04:11.439 units per year\n00:04:13.040 if we were to construct what we know is\n00:04:16.000 an exponential population growth\n00:04:18.320 behavior\n00:04:19.358 we could start with a stock of elephants\n00:04:21.680 and an inflow of new elephants\n00:04:23.600 born to this herd each year but this\n00:04:26.479 model is not correct\n00:04:28.320 we know the inflow cannot be constant\n00:04:30.880 because the number of new elephants born\n00:04:32.960 per year depends on knowing how many\n00:04:34.960 elephants are currently\n00:04:36.400 in the herd so we now indicate that\n00:04:39.680 dependency with a connector\n00:04:42.560 oh and now we have introduced a feedback\n00:04:45.680 loop\n00:04:46.400 the loop is reinforcing because the more\n00:04:49.280 elephants in the population\n00:04:51.280 the more new elephants are born per year\n00:04:54.080 adding more elephants to the herd\n00:04:56.639 but this model is still not complete we\n00:04:59.759 should\n00:05:00.320 indicate the number of new elephants\n00:05:02.479 born per\n00:05:03.759 elephant in the herd each year\n00:05:06.880 we do that by indicating a birth\n00:05:09.600 fraction\n00:05:10.240 in decimal form that will be multiplied\n00:05:13.199 by the number of elements\n00:05:14.639 in the herd each year so for exponential\n00:05:17.919 growth the inflow is proportional to the\n00:05:20.479 current amount of the stock\n00:05:22.880 or mathematically the rate of change the\n00:05:25.759 flow\n00:05:26.560 is defined as the stock value times some\n00:05:29.\n# \u301014\u2020Regenerative Development and Design A Framework for Evolving Sustainability (Regenesis Group) (Z-Library).pdf\u2020file-RjsEjuCBjkNC51NlmGBPS5uW\u3011\n(Ganado, Arizona), 125\u2013129, 125f, 131\nHull, Miller, 108, 110\nHumans:\n\n\u201cbattles\u201d with nature by, 9\u201310\ncolonization of system edges by, 160\u2013161\nas participants in evolution, 13\u201315\npositive environmental impacts by, 154\n\nHuman capital, 95, 98\nHumanistic psychology, 202\nHuman management practices, ecosystems \n\nand, 82\nHuman organization, patterns in, 57\u201358\n\n\n\nIndex228\n\nHuman systems,

guilds in, 89, 90\nHurricane Katrina, xxvi\nHyacinth macaws, 13\n\nI\nID LIVE! festival, 185\u2013186, 185f\u2013186f\nIllich, Ivan, 38\nIllinois, 91\u201392\nImaging, capacity for, 150\nIMEP (Integrated Metropolitan Environment \n\nPolicy), 86\nImprove (level of work), xxix\u2013xxx\nIncipience, mastery of, 209\nIndustrial Age, 10\u201311, 34\nInfinite diversity, 69\u201370\nInherent potential, 123\u2013124\nInner work:\n\nin regenerative development, 197, 202, 213\u2013214\nand self-actualization, 202\u2013203\n\nIntegrated Metropolitan Environment Policy \n(IMEP), 86\n\nInteraction patterns:\ndiscovering, 56\u201357\nin living systems, 47\u201348\n\nInterdependencies, in living networks, 156\u2013158\nInternational District (Albuquerque, New Mexico), \n\n183\u2013187, 193\nInvestor partners, 89, 93\u201394, 99\n\nJ\nJantsch, Erich, 216\nJefferson, Anne, xxvi\nJenkin, Sarah, xxvii\nEl Jobo project (La Palmilla, Mexico), 76f\n\nstakeholders in, 97\u2013100\nvocation of place for, 73\u201377\nweaving together of people and place in, 76\n\nJones, Michael, 38\nJones Falls River, 163\nJordan, Martin, 104\nJuluchuca, Mexico, 2\u20138, 2f\u20134f, 8f, 94\nJuniper trees, guilds around, 89, 90f\n\nK\nKahn, Sandra, 3, 4, 7\nKauffman, Stuart, 13, 84\nKemmis, Daniel, 159\nKeylines, 160\nKrishnamurti, Jiddu, 208\nKrone, Charles, xv, 9, 139\n\nKunstler, James, 34\nKurl, Laura Valdez, 2\n\nL\nLaing, R. D., 211\nLake County, Illinois, 91\u201392\nLancaster, Brad, 119, 121, 131\nLandry, Charles, 193\nLas Vegas, Nevada, 40\u201344, 41f\u201344f\nLas Vegas Valley Water Authority, 40\nLaszlo, Kathia, 201\nLatin America, ecosystem services in, xxi\nLaw of unintended consequences, 153\nLayne, Tanya, 86, 88\nLeaf-eating insects, California oaks and, 142\nLEED program, 40\nLegacy, vocation and, 78\nLeopold, Aldo, vi, 70\nLerner, Jaime, 63, 65\u201366, 71, 153,\n# \u301015\u2020tactiq-free-transcript-IoRjz8iTVoo.txt\u2020file-QAdtwx5q5xmFsPgGvYJdRiuF\u3011\n00:07:59.000 On the other hand, we're working with Berkshire Hathaway,\n00:08:01.000 Warren Buffett and Shaw Carpet,\n00:08:04.000 the largest carpet company in the world.\n00:08:05.000 We've developed a carpet that is continuously recyclable,\n00:08:08.000 down to the parts per million.\n00:08:11.000 The upper is Nylon 6 that can go back to caprolactam,\n00:08:14.000 the bottom, a polyolephine -- infinitely recyclable thermoplastic.\n00:08:17.000 Now if I was a bird, the building on my left is a liability.\n00:08:21.000 The building on my right, which is our corporate campus for The Gap\n00:08:24.000 with an ancient meadow, is an asset -- its nesting grounds.\n00:08:29.000 Here's where I come from. I grew up in Hong Kong,\n00:08:31.000 with six million people in 40 square miles.\n00:08:33.000 During the dry season, we had four hours of water every fourth day.\n00:08:37.000 And the relationship to landscape was that of farmers who have been\n00:08:40.000 farming the same piece of ground for 40 centuries.\n00:08:44.000 You can't farm the same piece of ground for 40 centuries\n00:08:46.000 without understanding nutrient flow.\n00:08:49.000 My childhood summers were in the Puget Sound of Washington,\n00:08:52.000 among the first growth and big growth.\n00:08:54.000 My grandfather had been a lumberjack in the Olympics,\n00:08:56.000 so I have a lot of tree karma I am working off.\n00:09:01.000 I went to Yale for graduate school,\n00:09:03.000 studied in a building of this style by Le Corbusier,\n00:09:05.000 affectionately known in our business as Brutalism.\n00:09:09.000 If we look at the world of architecture,\n00:09:12.000 we see with Mies' 1928 tower for Berlin,\n00:09:15.000 the question might be, "Well, where's the sun?"\n00:09:17.000 And this might have worked in Berlin, but we built it in Houston,\n00:09:20.000 and the windows are all closed. And with most

products\n00:09:23.000 appearing not to have been designed for indoor use,\n00:09:25.000 this is actually a vertical gas chamber.\n00:09:28.000 When I went to Yale, we had the first energy crisis,\n00:09:31.000 and I was designing the first solar-heated house in Ireland\n00:09:33.000 as a student, which I then built --\n00:09:35.000 which would give you a sense of my ambition.\n00:09:37.000 And Richard Meier, who was one of my teachers,\n00:09:39.000 kept coming over to my desk to give me criticism,\n00:09:41.000 and he would say, "Bill, you've got to understand- --\n00:09:43.000 solar energy has nothing to do with architecture."\n00:09:51.000 I guess he didn't read Vitruvius.\n00:09:53.000 In 1984, we did the first so-called "green office" in America\n00:09:57.000 for Environmental Defense.\n00:09:58.000 We started asking manufacturers what were in their materials.\n# \u301016\u2020v7-Rueter-chap6.pdf\u2020file-BvI6FLrOlLhn5vrhKoySqbmO\u3011\nDraft v7 147 \n\n \n\n6.8 Developing a simplified Systems model of \nsustainable resource use \nMany people subscribe to the idea that a sustainable resource is \none in which you reach a steady state because you don't use the \nresource faster than it is being created. Whether or not this is \nrequired for all resources to attain a sustainable society is a very \ninteresting question. It maybe that you can have some resources \ndecrease and be replaced by other resources. There are different \ndefinitions of overall sustainability that address whether the entire \nensemble of capital types has to be stable or whether substitutions \ncan be made. \n\nWe will focus here on the sustainable use of a single resource. For \nexample, you would harvest the wood at the same rate as new trees \nwere growing to replace what you took. \n\n \n \nFigure 6-10. The starting assumptions for a model of sustainable natural \nresources are that input comes from growth and output goes to harvest. There \nare no other inputs or fates being considered. \n\n \n\nIf this resource is based in natural (biological) capital the growth \nrate will often depend on the amount of the stock. For example \nhealthy fish populations grow faster with more fish and trees will \ngrow better in a healthy forest with lots of other trees to provide \nprotection and a suitable micro-climate. Although it isn't always \nthe case, let's model the natural resource as having a positive \nrelationship to the growth of new resource. \n\n\n\n148 August 13, 2013 \n\n \n\n \nFigure 6-11. In a simple sustainable harvest model, the natural resource has a \npositive feedback on the growth of that resource. This holds within the region of \nhealthy, and not over-abundant resource. \n\n \n\nWhen we harvest the resource, we might just be removing the fish \nor trees, but we can also be degrading the environment that the fish \nor trees need to grow. For example, driving bulldozers around on \nthe soil and channelizing streams in steep watersheds has a \nnegative effect on forest health. Similarly, some fishing methods \ndisrupt the breeding areas for fish. Thus the harvest has a direct \ntake of the resource but it can also degrade the conditions leading \nto a decrease in the growth rate. Notice in this case that a negative \neffect on conditions is passed through to impact growth because \nthere is a positive relationship between conditions and growth: \nworse conditions lead to lower growth. \n\n \n\n\n\nDraft v7 149 \n\n \n\n \nFigure 6-12. The mechanisms of harvest can have a negative effect on the \nconditions for growth. Overharvest can damage the microenvironment necessary \nfor optimal growth. \n\n \n\nAnother important issue with natural resource management is the \nimpact of bad (or good) luck. What if you were managing a forest \nthat had an average growth rate but there was a single drought year \nthat decreased the input to the resource by 50% just for that year? \nIf you had a harvest plan that was even just 5% more than the \nactual maximum yield you

could harvest, it would lead to a \ndecrease in the population that would never recover (assuming you \ndon't stop harvesting after you see the population start to crash). \n\n \n\n \n \n\nFigure 6-13. Conditions might also vary with time, such as a year of drought or \nunhealthy water. \n\n \n\n\n\n150 August 13, 2013 \n\n \n\nThe effect of one bad year (only 50% output) and an underestimate \nof true maximum yield by only 5%. In 100 years you're down to \nless than 1/3 of your starting natural capital.\n# \u301017\u2020Regenerative Development and Design A Framework for Evolving Sustainability (Regenesis Group) (Z-Library).pdf\u2020file-RjsEjuCBjkNC51NlmGBPS5uW\u3011\nPattern literacy, 209\u2013210\nPattern Mind (Glanzberg), 210\nPedestrian malls, 166\u2013167\n\nPeople:\nessence vs. gifts of, 124\u2013125\nrelationships of places and, vii, xxxi\u2013xxxii\nvocations from iconic, 78\nweaving together place and, 76\n\nPermaculture, xv, 169\nPlace(s). See also Living system approach to place\n\nat Central Park (McAllen, Texas), 49\u201355\ncommodification of, 34\u201337\ncommonwealth of, 94\nessence vs. gifts of, 124\u2013125\nlocational definitions of, 58\npartnering with, 39\u201344\nfor Playa Viva Resort, 3\u20135\nin regenerative development, xxxi\u2013xxxii, 37, \n\n215, 216\nrelationships of people and, vii, xxxi\u2013xxxii\nin Springs Preserve, 40\u201344\ntransformational leverage associated with, \n\n37\u201339\nand value-adding roles of projects, 139\u2013140\nvocations of, 63, 70\u201372\nweaving together people and, 76\n\nPlanning process, efficiency of, 193\nPlato, 112\nPlaya Viva Resort (Juluchuca, Mexico), 2\u20138, 2f\u20134f, \n\n8f, 94\nPortland, Oregon, 115\u2013117, 116f\nPossibility, potential vs., 123\nPotential, 111\u2013133\n\ncollective process for discovering, 194\nconceptualization based on, 177\ndefined, 117\u2013118\nin discovery phase of design projects, 112\u2013114\nin Dunbar/Spring stormwater harvesting proj-\n\nect, 119\u2013122\nand essence vs. gifts of people and places, \n\n124\u2013125\nand evolution, 117\u2013119\nfor evolution, 29\nand fields of caring, 205\nfinding right level of, 132\ngoals addressing, 151\nguidelines for engaging with, 131\u2013133\nharnessing energy of, 132\u2013133\nat Hubbell Trading Post National Historic Site, \n\n125\u2013128\ninherent, 123\u2013124\nnestedness of, 129\u2013130, 132\norientation toward, 114\u2013115, 131\u2013132\nin Portland, Oregon, 115\u2013117\nin regeneration, 113\n\n\n\nIndex 231\n\nfor systems, 128\nand will, 135\nworking from, 117\u2013122\n\nPoverty, water quality and, 166\nPozas, 171\nPrairie Crossing (Lake County, Illinois), 91\u201392\nPredesign process, 140, 187\u2013189, 194\nPredictions, by designers, v\nPreservation, see Protection and preservation \n\napproach\nPride, 58\u201359, 65\nProactive engagement, 181\u2013182\nProblem, defined, 117\nProblem solving:\n\nmindset for, xiii\u2013xiv\nas orientation to design, 111\u2013112, 114\u2013115, 194\nin regenerative development, 118\u2013119\n\nProduced capital, 95, 98\nProduct, see Design product\nProtection and preservation approach:\n\nin Grand Tetons farmland development \nproject, 115\n\nand northern California retreat center, 129\npartnering with place vs., 39\u201340\n\nProtectiveness, over development projects, \n177\u2013178\n# \u301018\u2020Regenerative Development and Design A Framework for Evolving Sustainability (Regenesis Group) (Z-Library).pdf\u2020file-RjsEjuCBjkNC51NlmGBPS5uW\u3011\nChapter 7 transformational Leverage 157\n\nset of patterns of organization that goes through all life, at all levels and in all \nits manifestations.\u201d4 He concludes, \u201cWherever we see life, we see networks.\u201d5\n\nThe networks that Capra describes are, in a sense, metabolic patterns. They \norganize the flows and exchanges of energy, material, and information that \nenable life. For example, a river supports the gallery forest that grows in its

\nfloodplain by providing water, sediments, nutrients, and beneficial distur-\nbance. In turn, a forest provides stabilization, shade, and groundwater pump-\ning to prevent concentration of mineral salts at the soil surface. The forest\u2019s \nvegetation creates shelter and habitat for numerous animal species, which \npollinate, cultivate, fertilize, and restructure both forest and river. The sun \nprovides energy for photosynthesis and evapotranspiration, as well as the \nlarger climatic cycles that replenish the river\u2019s water. These and many other \nelements are woven together through their patterns of exchange (Figure 7.2). \nThe significance of pattern, whether in a landscape, organization, or body, \nis that it can provide designers with a framework for understanding what is \nsourcing life in a particular place.\n\nFiguRe 7.2 In a gallery forest, as in all natural systems, a set of unifying patterns \norganize the continuing flow and transformative exchanges of energy, material, \nand information that enable life to be self-generating. \n\nCopyright \u00a9 U.S. Bureau of Land Management/flickr.com Creative Commons\n\n\n\n158 part two Creating regenerative processes\n\nLiving networks are metabolic patterns that organize flows and \nexchanges of energy, material, and information.\n\nFlows and nodes\n\nIn the 1970s, under UNESCO sponsorship, the \u201cMan and the Biosphere Pro-\ngram\u201d launched an international effort to investigate cities as organisms \u201cwith \nquantifiable flows of energy, materials and information.\u201d6 More than 100 stud-\nies, supporting the work of what became known as the urban metabolism \nschool, provided quantitative evidence of the extent to which cities, and the \nbuilt environment generally, were disrupting natural flows. This evidence \nunderscored the need to reintegrate natural processes with urban activities. \nIn a later development, urban ecology approached cities as ecosystems rather \nthan organisms. Like urban metabolism, it focused on the growing imbalance \nbetween cities and the larger systems from which they draw resource inputs \n(such as fuel and food) and into which they deliver waste outputs (such as \nair pollution and refuse). It identified this imbalance as the primary source \nof environmental degradation caused by the built environment and offered \nstrategies for more efficient resource use as the solution.\n\nToday, growing interest in net positive design is stimulating exploration into \nhow cities can simply reduce these inputs and outputs. This raises the ques-\ntion of how the built environment can \u201cengage in . . . resource flows such that \nwhen resources are returned [to the system from which they were drawn], \nthey support the maintenance of ecosystem functions to enable them to pro-\nvide necessary services.\u201d7 For example, instead of sending sludge from sew-\nage treatment centers to landfills, it can be used to fertilize tree plantings.\n# \u301019\u2020Regenerative Development and Design A Framework for Evolving Sustainability (Regenesis Group) (Z-Library).pdf\u2020file-RjsEjuCBjkNC51NlmGBPS5uW\u3011\nect, 119\u2013122\nand essence vs. gifts of people and places, \n\n124\u2013125\nand evolution, 117\u2013119\nfor evolution, 29\nand fields of caring, 205\nfinding right level of, 132\ngoals addressing, 151\nguidelines for engaging with, 131\u2013133\nharnessing energy of, 132\u2013133\nat Hubbell Trading Post National Historic Site, \n\n125\u2013128\ninherent, 123\u2013124\nnestedness of, 129\u2013130, 132\norientation toward, 114\u2013115, 131\u2013132\nin Portland, Oregon, 115\u2013117\nin regeneration, 113\n\n\n\nIndex 231\n\nfor systems, 128\nand will, 135\nworking from, 117\u2013122\n\nPoverty, water quality and, 166\nPozas, 171\nPrairie Crossing (Lake County, Illinois), 91\u201392\nPredesign process, 140, 187\u2013189, 194\nPredictions, by designers, v\nPreservation, see Protection and preservation \n\napproach\nPride, 58\u201359, 65\nProactive engagement,

181\u2013182\nProblem, defined, 117\nProblem solving:\n\nmindset for, xiii\u2013xiv\nas orientation to design, 111\u2013112, 114\u2013115, 194\nin regenerative development, 118\u2013119\n\nProduced capital, 95, 98\nProduct, see Design product\nProtection and preservation approach:\n\nin Grand Tetons farmland development \nproject, 115\n\nand northern California retreat center, 129\npartnering with place vs., 39\u201340\n\nProtectiveness, over development projects, \n177\u2013178\n\nProximate whole, 56\nPublic engagement, 108, 109f, 189\u2013190\nPublic hearings, 188\nPublic relations, 91, 189\u2013190\nPutnam, Robert, 84\n\nQ\nQuesada Gardens Initiative (San Francisco, \n\nCalifornia), xxx\nQuigley Farm and Conservation Community, \n\nxxxii\u2013xxxiii, 92\u201393\nQuivira Coalition, xxix\u2013xxx\n\nR\nRadial model of city, 67\nRamo, Joshua, 209\nReactivity, of activists, 178\u2013179\nReality:\n\nseeing deeper, 205\nshaping, 211\n\nReciprocity, 88, 142, 194\nRedevelopment project, in Brittany, France, \n\n199\u2013200, 199f\nRed Queen\u2019s dilemma, 71\u201372\n\nReed, Bill, 104\u2013106, 108\nReflection, 211\nRegenerate (level of work), xxx\u2013xxxi\nRegeneration, xxviii\u2013xxxi\n\nby guilds, 91\u201392\nand organizing process, 71\u201372\npotential in, 113\n\nRegenerative concepts, 142\u2013144\nRegenerative design:\n\naims of, vi\u2013vii\ndevelopmental, 182\u2013183\neffects of, vii\u2013viii\n\nRegenerative Design for Sustainable Development \n(Lyle), xxii\nVisible: 0% - 100%", "summary": null, "assets": [], "tether_id": null}, "status": "finished_successfully", "end_turn": null, "weight": 0.0, "metadata": {"_cite_metadata": {"citation_format": {"name": "tether_og"}, "metadata_list": [{"type": "file", "name": "SRM DQ4.docx", "id": "file-jrIPCdBup7OEovvS9tDvhMTh", "source": "my_files", "text": "\nPart 2: What indicators are required to assess the systems dynamics of flow-limited resources? \nTo effectively assess the dynamics of flow-limited resources within a system a systems dynamics model must incorporate several key indicators. These indicators include stocks flows converters/constants and information flows each playing a crucial role in understanding and predicting system behaviors.\nStocks represent the quantities of resources available within the system at any given time. These could be tangible elements like water in a reservoir or abstract quantities such as carbon or even a population count in an ecological study. Stocks are foundational for monitoring resource levels and serve as a baseline for measuring changes over time (Reuter 2013)\nFlows describe the movement of resources between stocks or from external sources into the system. This includes inputs and outputs measured over specific time intervals such as liters of water per hour or tons of carbon per year. Understanding flows is critical for assessing how resources are utilized and replenished within the system providing insights into sustainability and efficiency (Reuter 2013).\nConverters/constants are parameters within the model that affect flows or stocks but remain unchanged regardless of system dynamics. These could include growth rate constants conversion efficiencies or fixed loss rates which are essential for stabilizing the model and making accurate predictions (Reuter 2013).\nInformation flows represent the non-material connections that influence system components by altering flows or converters based on the state of stocks or other variables. This aspect of systems dynamics is crucial for modeling feedback mechanisms and adaptive behaviors within the system allowing for a more nuanced understanding of how changes in one part of the system can ripple through to others (Reuter 2013).\nBy integrating these components into a systems dynamics model it is possible to construct a comprehensive view of how resources are interlinked and governed by various dynamic factors. This holistic approach is vital for predicting future system states under

different scenarios and for making informed decisions about resource management and conservation.\nWhat inputs might be incorporated into a model of flow-limited resources? How is this different from stock-limited resources? In resource management two distinct modeling approaches are used to predict and understand resource availability and sustainability: flow-limited and stock-limited models.\nFlow-limited models focus on the dynamics of resource renewal and consumption. These models consider key inputs like the rate at which a resource regenerates whether naturally or through human efforts. They also analyze the consumption rate to see how quickly the resource is being used by various entities or processes. Additionally factors like environmental conditions regulatory policies and technological changes play significant roles in influencing resource availability and flow. This model is dynamic adapting to changes in usage patterns and replenishment strategies providing a flexible framework for forecasting future resource statuses (Reuter 2013).\nIn contrast stock-limited models are concerned with the finite quantities of resources available. They focus on the absolute amount of the resource that exists or can be accessed such as fossil fuels or minerals. These models consider extraction or harvest rates detailing how quickly the resource is depleted over time. They also evaluate the resource\u2019s regeneration capabilities whether it can be naturally replenished or artificially sustained over long periods. This approach emphasizes the depletion of a fixed stock highlighting the limits of availability and the critical need for conservation and efficient use (Reuter 2013).\nThe main difference between these two models lies in their focus and application. Flow-limited models are dynamic reflecting continuous changes in resource flows and the effects of various influencing factors. They are particularly useful when resources can be renewed or are affected by external conditions. On the other hand stock-limited models deal with resources that have fixed availability concentrating on managing finite supplies and preventing exhaustion. Understanding these differences is crucial for policymakers businesses and conservationists. It helps in developing effective strategies for resource management ensuring sustainability and tackling the challenges posed by limited natural resources (Fisher 2020).\n", "extra": null}, {"type": "file", "name": "Regenerative Development and Design A Framework for Evolving Sustainability (Regenesis Group) (Z-Library).pdf", "id": "file-RjsEjuCBjkNC51NlmGBPS5uW", "source": "my_files", "text": "\nThe project was initially conceived as a fairly conventional demonstration site \nfor desert gardening. A turning point came when the Las Vegas Valley Water \nAuthority realized that it needed to shift its thinking from building a project \nthat was in the desert to building one that was of the desert. With this shift \nin attitude and perspective the design team, led by the Las Vegas firm LGA, \nbegan to create something that would serve as a regenerative force.\n\nAn interdisciplinary design team that included architects, landscape archi-\ntects, engineers, biologists, hydrologists, sustainability experts, and commu-\nnity stakeholders worked together to realize this vision. Much of the leadership \n\n\n\nChapter 2 Understanding place 41\n\nwas provided by Patricia Mulroy of the Las Vegas Valley Water Authority. \nBefore accepting a position at the Brookings Institute, Mulroy had earned a \nnational reputation as the \u201cWater Witch of Las Vegas.\u201d As manager of all the \nwater resources for one of America\u2019s fastest growing cities, she demonstrated a \n\n\nfigure 2.3 An architectural rendering showing the layout of botanical and \n conservation gardens at Springs Preserve in Las Vegas, Nevada.\nCourtesy LGA\n\n\n\n42 part One Creating regenerative projects\n\n formidable grasp of the complexities and strategic challenges raised by intense \ndryland development in an age of climate

change. Early on, she recognized that \nlife in a world of water scarcity was going to require more than technological \nsolutions. It was going to require the emergence of a new culture.\n\nAmong the land holdings of Mulroy\u2019s agency was a jewel hidden in plain \nsight\u2014180 acres in the heart of the city. The site housed a well field, stor-\nage tanks, and water treatment plant, and was surrounded by industrial \nneighborhoods. For generations it had served as a kind of open space, an \nunsupervised refuge for teenagers and young lovers. In the 1980s local pres-\nervationists had quietly worked with the water district to secure its historic \nstatus, but it remained dormant with regard to public engagement until the \nmid-1990s. The question was what to do with it.\n\nThe site contains a complex of artesian springs\u2014a true oasis in the desert. \nArchaeological evidence indicates an Anasazi presence in the area, followed \nby the southern Paiute for whom the springs were a major water source. The \nSpanish encountered the lush grasslands of this oasis and gave the area its \nname, Las Vegas, which means the meadows. It was a major campsite on the \nSpanish trail, which provided an east-west link to the far-flung Spanish empire \n\nfigure 2.4 The Desert Living Center and Sustainability Gallery at Springs Preserve.\nCourtesy LGA\n\n\n\nChapter 2 Understanding place 43\n\nin the American southwest. In the mid-nineteenth century, the Mormons set-\ntled the area just downstream of the springs. Later, the site became an impor-\ntant stop on the railroad that connected Salt Lake City to Los Angeles. At the \nbeginning of the twentieth century, developers from Los Angeles, in connec-\ntion with the railroads, finally established the city of Las Vegas (Figure 2.5).\n\nfigure 2.5 Botanical gardens at the Springs Preserve featuring local native plants.\nCourtesy LGA\n\nRecognizing that Las Vegas\u2019 water use was shortsighted, Mulroy knew that \nthis project needed to catalyze a shift in the city toward a culture of sustain-\nability. She encouraged the project team to engage in a planning process \nwhose focus was community development rather than site development. \nShe wanted to grow new capability within the water district, and that would \nrequire bringing together a larger than usual circle of stakeholders.\n", "extra": null}, {"type": "file", "name": "Regenerative Development and Design A Framework for Evolving Sustainability (Regenesis Group) (Z-Library).pdf", "id": "file-RjsEjuCBjkNC51NlmGBPS5uW", "source": "my_files", "text": "\nin Baltimore Harbor project, 163\u2013165, 163f\u2013165f\nin Curitiba, Brazil, 69\n\nTrees, value added by, 17\u201318, 18f\nTucson, Arizona, 119\u2013122, 120f, 121f\nTurtle sanctuary (Playa Viva Resort), 6, 6f\nTuxtla Guti\u00e9rrez, Mexico, 169\u2013172, 170f\n\nU\nUncertainty, 201\nUnderstanding, 150\u2013151\nUNESCO, 158\nUniformity, manageable, 70\nUnintended consequences, law of, 153\nUniqueness:\n\nand conventional sustainability planning, 61\nrespecting, 195\ntalent vs., 124\u2013125\n\nUnited Nations, xxiv, 96\nU.S. Forest Service, 145, 146, 148, 149, 152\nU.S. Green Building Council, 40\nUniversity of Las Vegas DesertSol Solar House, 40\nUniversity of New Mexico School of Architecture \n\nand Planning, 184\nUnpredictability, 21\nUrban acupuncture, 156, 167\n\nUrban design, 24\nUrban ecology, cities in, 158\nUrban Garden (theme), 105\nUrbanism, 65\u201367, 167\nUrban Learning Group, xxii\nUrban metabolism school, 158\nUsers, in design process, 103\n\nV\nValley Yokut tribe, xxvii\nValue(s):\n\nadding, see Adding value\nincreasing capacity to generate, 30\u201331\nof restraints, 131\nsharing project\u2019s, 194\u2013195\n\nValue added (term), 139\nValue-adding roles:\n\nand conceptualization in regenerative develop-\nment, 142\u2013144\n\nand goals of regenerative projects, 137\u2013138\nfor Living Rooms at the Border project, 25\nfor Middle Kyle Canyon project, 145\u2013150, 147f\nin natural systems, 140\u2013142\nof regenerative

projects, 138\u2013144\n\nVancouver, British Columbia, 104\u2013110, 104f, 106f\nVan der Ryn, Sim, v\u2013vi\nVermont, 25\u201329, 26f, 28f, 31\nViability, value creation and, 17\u201318\nVillafranca, Raul de, 73\u201376, 78, 97\u2013100\nVi\u00f1a del Mar, Chile, 189\u2013192, 190f\u2013191f\nVirtuous cycles, 18\nVitalization, from energy fields, 206\u2013207\nVocation(s), 61\u201379\n\napplying, to design, 77\u201379\nin Curitiba, Brazil, 64\u201369\nin El Jobo project, 73\u201376\nnested, 72\u201373\nin regenerative development, 62\u201364\nas source of direction, 62\u201364, 69\u201370, 78\u201379\nsustainability as byproduct of, 62\n\nVocation of place:\ndirection from, 78\u201379\ndiscovering, 77\u201378\nin El Jobo project, 73\u201377\nin regenerative development, 70\u201372\n\nW\nWahl, Daniel, 45\nWaldrop, Mitchell, 16\nWalker, Stuart, vii\nWaterfront Partnership of Baltimore, 162, 163\n\n\nIndex 235\n\nWater quality, poverty and, 166\nWater stress, xxi\nWater use, at Springs Preserve, 40\u201343\nWealth, 94\u201397\n\nin complex systems, 21\nand direction, 70\nfive capitals framework of, 95\u201397, 96f\n", "extra": null}, {"type": "file", "name": "SRM DQ4.docx", "id": "file-jrIPCdBup7OEovvS9tDvhMTh", "source": "my_files", "text": "\nWhat inputs might be incorporated into a model of flow-limited resources? How is this different from stock-limited resources? In resource management two distinct modeling approaches are used to predict and understand resource availability and sustainability: flow-limited and stock-limited models.\nFlow-limited models focus on the dynamics of resource renewal and consumption. These models consider key inputs like the rate at which a resource regenerates whether naturally or through human efforts. They also analyze the consumption rate to see how quickly the resource is being used by various entities or processes. Additionally factors like environmental conditions regulatory policies and technological changes play significant roles in influencing resource availability and flow. This model is dynamic adapting to changes in usage patterns and replenishment strategies providing a flexible framework for forecasting future resource statuses (Reuter 2013).\nIn contrast stock-limited models are concerned with the finite quantities of resources available. They focus on the absolute amount of the resource that exists or can be accessed such as fossil fuels or minerals. These models consider extraction or harvest rates detailing how quickly the resource is depleted over time. They also evaluate the resource\u2019s regeneration capabilities whether it can be naturally replenished or artificially sustained over long periods. This approach emphasizes the depletion of a fixed stock highlighting the limits of availability and the critical need for conservation and efficient use (Reuter 2013).\nThe main difference between these two models lies in their focus and application. Flow-limited models are dynamic reflecting continuous changes in resource flows and the effects of various influencing factors. They are particularly useful when resources can be renewed or are affected by external conditions. On the other hand stock-limited models deal with resources that have fixed availability concentrating on managing finite supplies and preventing exhaustion. Understanding these differences is crucial for policymakers businesses and conservationists. It helps in developing effective strategies for resource management ensuring sustainability and tackling the challenges posed by limited natural resources (Fisher 2020).\nProvide an example of the systems dynamics of:\nA stock-limited resource (such as cobalt)\nA flow-limited resource (such as rabbits)\nDescribe what and how you would measure the inputs outputs and feedback loops (in-flow out-flow connectors or dependencies stocks and sources or sinks) in each example. Keep it simple (i.e. bamboo production for chairs). You don\u2019t have to do the mathematical calculations just describe the systems process. (If you want to take it further you can use Stella

Online Modeling linked above).\n", "extra": null}, {"type": "file", "name": "Regenerative Development and Design A Framework for Evolving Sustainability (Regenesis Group) (Z-Library).pdf", "id": "file-RjsEjuCBjkNC51NlmGBPS5uW", "source": "my_files", "text": "\nFor water harvesting expert Brad Lancaster, rain has never been a prob-\nlem. Over the years, he has converted his once barren neighborhood of \nDunbar/Spring in Tucson, Arizona, into a leafy refuge from the hot desert sun \n(Figures 5.2A and B). Beginning with his own property, Lancaster diverted \nstreet and sidewalk runoff into swales planted with food-bearing, native trees \n(Figure 5.3). The results were so impressive that his neighbors soon followed \nsuit. As a result, the neighborhood created a new identity for itself. From a \n\n\n\n120 part two Creating regenerative processes\n\nsketchy reputation as a formerly segregated and then downtrodden and \ncrime-ridden place, it was transformed to a proud example of how to live well \nin the desert southwest.\n\nfigure 5.2a A street in the Dunbar/Spring neighborhood of \nTucson, Arizona, in 1994, before swales were dug and food-\nbearing trees were planted. \nCopyright \u00a9 Brad Lancaster. Reproduced with permission from \nRainwater Harvesting for Drylands and Beyond by Brad Lancaster.\n\nfigure 5.2B The same street in 2006\u2014a representative image \nof transformation throughout the neighborhood. \nCopyright \u00a9 Brad Lancaster. Reproduced with permission from \n Rainwater Harvesting for Drylands and Beyond by Brad Lancaster.\n\n\n\nChapter 5 Start from potential 121\n\nAs Lancaster recalls:\n\nThe tree planting enabled the people of the neighborhood to come \ntogether\u2014new and old residents, alike\u2014around a shared and worthy \npurpose. What made it significant is that we emphasized water harvest-\ning before tree planting. That set us apart. Lots of communities are plant-\ning trees, but the rainwater piece took it to another level because we \nweren\u2019t contributing to the extraction of groundwater. Then we began \nto host an annual festival that featured native foods harvested from the \ntrees right here in the neighborhood (Figures 5.4 and 5.5). This attracted \na lot of visitors and set an example for the city, which started to embrace \nour pioneering innovations as public policy.6\n\nWhen the neighborhood was awarded a half-million-dollar improvement \ngrant, residents decided to dedicate the funds to water harvesting, traffic \ncalming, tree planting, and public art that told their story. Money for resources \nand labor enabled elderly people and others to participate. What had been \nan exciting but cutting-edge project had now become the neighborhood \nnorm, deeply embedded into its identity.7\n\nfigure 5.3 In the Dunbar/Spring neighborhood, a newly \nconstructed water-harvesting chicane (basin) along a bicycle \nboulevard is filled with rainwater after a summer storm. \n\nCopyright \u00a9 Brad Lancaster. Reproduced with permission from \nRainwater Harvesting for Drylands and Beyond by Brad Lancaster.\n\n\n\n122 part two Creating regenerative processes\n\nfigure 5.4 A mobile hammermill grinds neighborhood-grown-and-harvested \nmesquite pods into edible flour. \nCopyright \u00a9 Brad Lancaster. Reproduced with permission from \n Rainwater Harvesting for Drylands and Beyond by Brad Lancaster.\n\nfigure 5.5 Everyone is invited to participate in the neighborhood prickly \npear harvest! \nCopyright \u00a9 Brad Lancaster. Reproduced with permission from \n Rainwater Harvesting for Drylands and Beyond by Brad Lancaster.\n\n\n\nChapter 5 Start from potential 123\n\nPotential iS inherent\n\nOne way to characterize living systems is that each is distinctive, with an \nessence that is the source of its uniqueness. This perspective can be applied \nat any scale, whether the living system is a tree or a forest, a person or a city. \nRegenerative potential arises from this distinctive core character.\n", "extra": null}, {"type": "file", "name": "SRM

DQ4.docx", "id": "file-jrIPCdBup7OEovvS9tDvhMTh", "source": "my_files", "text": "\nPart 1: What are the three dimensions of improvement in Life Cycle Sustainability Assessment suggested in the reading? Describe why these are important and relate and apply the three dimensions to your learning from earlier modules.According to Onat et al. (2017) three key dimensions of improvement are suggested to enhance the effectiveness of sustainability assessments. These dimensions include the integration of environmental economic and social dimensions the application of systems thinking and the active engagement of stakeholders. Each of these elements is vital for constructing a holistic and effective approach to sustainability that transcends the limitations often imposed by capitalist systems which typically prioritize profit at the expense of environmental and social equity.\nThe overall approach to sustainability presented by Onat et al. (2017) emphasizes the necessity of considering the environmental economic and social impacts of products or services throughout their lifecycle. It stands in contrast to and challenges the capitalist tendency to focus solely on economic gains by highlighting the interconnectedness of these dimensions. Ignoring any of these aspects can lead to solutions that might appear beneficial in one area but are detrimental in others.Systems thinking requires understanding the complete lifecycle of a product or service\u2014from raw material extraction to disposal\u2014and identifying potential impacts at each stage. This method helps in pinpointing critical points for intervention and prevents unintended consequences that could arise from changes made in isolation. One can clearly see the links between systems thinking and the ideas presented by Ostrum (1997) which expands the rational choice models to incorporate collective actions that better address complex social dilemmas. It challenges simplistic linear thinking\u2014common in capitalist approaches\u2014that often overlook long-term consequences for immediate profit.\nFinally engaging stakeholders across the lifecycle of a product or service ensures that the diverse values and needs of different groups are considered and addressed in the sustainability assessment process. This approach is crucial for democratizing decision-making processes which often are controlled top-down in capitalist structures. Fisher\u2019s (2020) discussions on how system dynamics modeling can involve stakeholders in understanding and managing complex systems effectively provide a solid argument for stakeholder engagement across the lifecycle. \nBy applying these three dimensions to the broader discussions from earlier modules it becomes evident how these principles can help counteract the equity and sustainability challenges exacerbated by capitalist systems. These dimensions advocate for a more inclusive holistic and long-term approach to sustainability that aligns with social equity and environmental stewardship rather than focusing narrowly on immediate economic outcomes. This integrated approach not only critiques but actively challenges the inequities perpetuated by capitalist systems paving the way for more sustainable and equitable global practices.\n\nPart 2: What indicators are required to assess the systems dynamics of flow-limited resources? \nTo effectively assess the dynamics of flow-limited resources within a system a systems dynamics model must incorporate several key indicators. These indicators include stocks flows converters/constants and information flows each playing a crucial role in understanding and predicting system behaviors.\nStocks represent the quantities of resources available within the system at any given time. These could be tangible elements like water in a reservoir or abstract quantities such as carbon or even a population count in an ecological study. Stocks are foundational for monitoring resource levels and serve as a baseline for measuring changes over time (Reuter

2013)\nFlows describe the movement of resources between stocks or from external sources into the system. This includes inputs and outputs measured over specific time intervals such as liters of water per hour or tons of carbon per year. Understanding flows is critical for assessing how resources are utilized and replenished within the system providing insights into sustainability and efficiency (Reuter 2013).\nConverters/constants are parameters within the model that affect flows or stocks but remain unchanged regardless of system dynamics. These could include growth rate constants conversion efficiencies or fixed loss rates which are essential for stabilizing the model and making accurate predictions (Reuter 2013).\nInformation flows represent the non-material connections that influence system components by altering flows or converters based on the state of stocks or other variables.\n", "extra": null}, {"type": "file", "name": "Regenerative Development and Design A Framework for Evolving Sustainability (Regenesis Group) (Z-Library).pdf", "id": "file-RjsEjuCBjkNC51N1mGBPS5uW", "source": "my_files", "text": "\nBecause partnership is relational, it moves us beyond the paternalism of pro-\ntection and preservation. Conservationist Peter Forbes has noted that:\n\n. . . 42 percent of the private land in America is posted No Trespassing. \nAnd nearly 80 percent of land \u201cprotected\u201d by private conservation orga-\nnizations is posted No Trespassing. . . . Saving land while losing human \nunderstanding of the land, what lives there, why it needs to be part of \nour lives, what it has meant throughout history is to create conflict. . . . \nAs a nation and as a movement, we\u2019ve spent too much time separating \n\n\n\n40 part One Creating regenerative projects\n\npeople and the land and precious little time being in dialogue about \nwhat defines a healthy relationship between the two.10\n\nrenewing The sourCe\n\nThe award-winning Springs Preserve in Las Vegas, Nevada, is an example of \nwhat can result when a design focus shifts from preserving to partnering. The \npreserve is a unique natural area located in the historic heart of Las Vegas, \nNevada. It includes a Desert Living Center and Sustainability Gallery, the \nNevada State Museum, Origen Museum, the University of Las Vegas DesertSol \nSolar House, a butterfly habitat, botanical and conservation gardens, a recre-\nated spring pool, and extensive trails. It also houses a reservoir and pumping \nstation that delivers potable water to much of the metropolitan area. The site \nis important archaeologically, historically, and culturally (Figures 2.3 and 2.4).\n\nAn abundance of sustainable and appropriate technologies integrate the \npreserve into the hot dry climate of the Mojave Desert. Passive solar design, \nrammed earth and straw bale construction, biological wastewater treatment, \ngrid-tied photovoltaics, protection of archaeological and biological resources, \nand native plant landscaping have all contributed to earning it a platinum cer-\ntification from the U.S. Green Building Council\u2019s LEED program. Equally impor-\ntant, the project is locally beloved and has become one of the city\u2019s most \npopular destinations. Las Vegas residents come to the preserve to learn how \nto incorporate water conservation and sustainable practices into their daily \nlives. In this way, it has positioned itself as an advocate, promoting conserva-\ntion and appreciation of the desert environment as a special place to live.\n\nThe project was initially conceived as a fairly conventional demonstration site \nfor desert gardening. A turning point came when the Las Vegas Valley Water \nAuthority realized that it needed to shift its thinking from building a project \nthat was in the desert to building one that was of the desert. With this shift \nin attitude and perspective the design team, led by the Las Vegas firm LGA, \nbegan to create something that would serve as a regenerative force.\n\nAn interdisciplinary design team that included

architects, landscape archi-\ntects, engineers, biologists, hydrologists, sustainability experts, and commu-\nnity stakeholders worked together to realize this vision. Much of the leadership \n\n\nChapter 2 Understanding place 41\n\nwas provided by Patricia Mulroy of the Las Vegas Valley Water Authority. \nBefore accepting a position at the Brookings Institute, Mulroy had earned a \nnational reputation as the \u201cWater Witch of Las Vegas.\u201d As manager of all the \nwater resources for one of America\u2019s fastest growing cities, she demonstrated a \n\nfigure 2.3 An architectural rendering showing the layout of botanical and \n conservation gardens at Springs Preserve in Las Vegas, Nevada.\nCourtesy LGA\n\n\n\n42 part One Creating regenerative projects\n", "extra": null}, {"type": "file", "name": "Regenerative Development and Design A Framework for Evolving Sustainability (Regenesis Group) (Z-Library).pdf", "id": "file-RjsEjuCBjkNC51NlmGBPS5uW", "source": "my_files", "text": "\nVancouver, British Columbia, 104\u2013110, 104f, 106f\nVan der Ryn, Sim, v\u2013vi\nVermont, 25\u201329, 26f, 28f, 31\nViability, value creation and, 17\u201318\nVillafranca, Raul de, 73\u201376, 78, 97\u2013100\nVi\u00f1a del Mar, Chile, 189\u2013192, 190f\u2013191f\nVirtuous cycles, 18\nVitalization, from energy fields, 206\u2013207\nVocation(s), 61\u201379\n\napplying, to design, 77\u201379\nin Curitiba, Brazil, 64\u201369\nin El Jobo project, 73\u201376\nnested, 72\u201373\nin regenerative development, 62\u201364\nas source of direction, 62\u201364, 69\u201370, 78\u201379\nsustainability as byproduct of, 62\n\nVocation of place:\ndirection from, 78\u201379\ndiscovering, 77\u201378\nin El Jobo project, 73\u201377\nin regenerative development, 70\u201372\n\nW\nWahl, Daniel, 45\nWaldrop, Mitchell, 16\nWalker, Stuart, vii\nWaterfront Partnership of Baltimore, 162, 163\n\n\n\nIndex 235\n\nWater quality, poverty and, 166\nWater stress, xxi\nWater use, at Springs Preserve, 40\u201343\nWealth, 94\u201397\n\nin complex systems, 21\nand direction, 70\nfive capitals framework of, 95\u201397, 96f\n\nWeb of life, 156\nWeil, Simone, 38\nWell-being, genuine wealth and, 95\nWestchester, New York, housing project in, \n\n143\u2013144\nWestern Cape, South Africa, 85\u201386\nWestern cultures:\n\natomizing bias in, 207\nthinking patterns in, 208\u2013210\n\nWetlands platforms, 163\u2013165, 163f\u2013165f\n\n\u201cWhat kind of here is this?\u201d question, 58\u201359\nWheatley, Meg, 210\nWhole Foods, 27\nWildcat, Daniel, xix, xxxii\nWilderness, 39\nWildlife corridors, 82, 83f\n\nWill:\nand agency, in regenerative development, \n\nxiv\u2013xv\nleveraging of, 68\u201369\nand potential, 135\nin regenerative development, 182\n\nWindham and Windsor Housing Trust, 25\nWorking from potential:\n\nDunbar/Spring stormwater management \nproject, 119\u2013122\n\nin regenerative development, 117\u2013119\nWork in progress, being, 211\u2013212\n\nY\nYellowstone National Park, 140\u2013142, 141f, 151, 156\nYield, maximum vs. optimal, 70\nYsidro Sin Limites workshops, 23\nYucatan peninsula, 47\u201348\n\nZ\nZari, Maibritt Pedersen, xxvii\nZoning, 23, 180\n\n\n\nWILEY END USER LICENSE\nAGREEMENT\n\nGo to www.wiley.com/go/eula to access Wiley\u2019s ebook\nEULA.\n\nhttp://www.wiley.com/go/eula\n\n\tRegenerative Development and Design: A Framework for Evolving Sustainability\n\tContents\n\tForeword\n\tAcknowledgments\n\tChanging Our Minds\n\tRegenerative Development\n\tWe Are All Designers\n\tAn Invitation\n\tEndnote\n\n\tThe Future of Sustainability\n\tA Growing Need for Integration\n\tWhat Is Sustainability\u2014Really?\n\tTwo Models of Nature\n\tThe Changing Meaning of Sustainability\n", "extra": null}, {"type": "file", "name": "v7-Rueter-chap6.pdf", "id": "file-BvI6FLr0lLhn5vrhKoySqbmO", "source": "my_files", "text": "\n130 August 13, 2013 \n\n \n\n \n\n \n\nChapter 6 \u2013 Stock and Flow Systems

\n \n6.1 Introduction \nEcological, geochemical and human processes can be described by \nfollowing the flows of material or energy from one place or form \nto another. A "system" is any set of connected processes and \nquantities of resources. It can be as larger or as small as you want \nto set the boundaries around. Although some people use the term \n"systems approach" to be holistic and inclusive, our use of the \nword "systems view" specifies a set of intellectual tools that can be \napplied to any size set of processes and resources. \n\nThis text presents one specific definition of how to characterize an \nenvironmental problem as a system of stocks and flows. We will \nbe using a limited list of characteristics of a system that can be \nused to describe many different structures and behaviors. Our \nconstrained set of categories will help highlight the structural \nsimilarities and differences between different systems. \n\nThis "systems" approach is useful for simplifying problems, \nlooking for significant processes and identifying controls. The \napproach can also be used to create simulations of future \nconditions and to communicate these to other people who are \nmaking decisions. Another of the benefits of this approach is that it \nclearly identifies the assumptions on which simulations are based. \nA good "systems" model is both a valuable research tool and a \nplatform for communication and decision-making. Thus, carefully \ngathering information to construct a stock and flow description of \nan environmental problem is a good example of methodically \ncollecting information that takes place in scientific research (Pielke \n2007). \n \n\n\n\nDraft v7 131 \n\n \n\n\n6.2 Model Components \nThere are five components that we will use to represent the \nstructure and behavior of our chosen system: stocks, flows, \ninformation flows, convertors/constants and a source/sink. An icon \nrepresents each component. For example, look at the growth of a \npopulation of rabbits (see Figure 1). \n\n \n\n \nFigure 6-1. A simple systems diagram for the increase in a population of rabbits \nillustrates the five objects that we will use. \nStocks are a quantity of something. Water in a tank is a good \nexample of a stock. Sometimes stocks are called reservoirs. All the \nstocks that are connected with flows will have the same units, that \nis all the stocks will be a quantity of water, or an amount of carbon, \nor the number of people, etc. In our example, the stock is the \n\n\n\n132 August 13, 2013 \n\n \n\nnumber of rabbits in the population. We represent this in a systems \ndiagram with a box icon. \n\nA source or sink is either has an unlimited, unchanging \nconcentration or a reservoir that is outside the boundaries of the \nsystem that we are studying. In our example, the source of new \nmatter that supports rabbit growth is not being considered. You can \nimagine another model where the amount of food available to the \nrabbit population limited the amount of new rabbits being born. In \nthis case, we would probably model the system to include the \nnutrients as a stock rather than a source/sink. A source/sink is \nrepresented as a little cloud in our diagrams. \n\nFlows connect stocks or source/sinks. The flow will increase any \nstock that it flows into or decrease a stock that it flows out of. All \nthe flows that are connected to a stock will have the units of \nwhatever the units of the stocks are per time. For example this \ncould be liters of water per hour, tons of carbon per year, or in our \nexample, rabbits per month.\n", "extra": null}, {"type": "file", "name": "Regenerative Development and Design A Framework for Evolving Sustainability (Regenesis Group) (Z-Library).pdf", "id": "file-RjsEjuCBjkNC51N1mGBPS5uW", "source": "my_files", "text": "\nThe site contains a complex of artesian springs\u2014a true oasis in the desert. \nArchaeological evidence indicates an Anasazi presence in the area, followed \nby the southern Paiute for whom the springs were a major water source.

The \nSpanish encountered the lush grasslands of this oasis and gave the area its \nname, Las Vegas, which means the meadows. It was a major campsite on the \nSpanish trail, which provided an east-west link to the far-flung Spanish empire \n\nfigure 2.4 The Desert Living Center and Sustainability Gallery at Springs Preserve.\nCourtesy LGA\n\n\n\nChapter 2 Understanding place 43\n\nin the American southwest. In the mid-nineteenth century, the Mormons set-\ntled the area just downstream of the springs. Later, the site became an impor-\ntant stop on the railroad that connected Salt Lake City to Los Angeles. At the \nbeginning of the twentieth century, developers from Los Angeles, in connec-\ntion with the railroads, finally established the city of Las Vegas (Figure 2.5).\n\nfigure 2.5 Botanical gardens at the Springs Preserve featuring local native plants.\nCourtesy LGA\n\nRecognizing that Las Vegas\u2019 water use was shortsighted, Mulroy knew that \nthis project needed to catalyze a shift in the city toward a culture of sustain-\nability. She encouraged the project team to engage in a planning process \nwhose focus was community development rather than site development. \nShe wanted to grow new capability within the water district, and that would \nrequire bringing together a larger than usual circle of stakeholders.\n\nThe team very quickly uncovered a profound conflict. Some wanted to pre-\nserve the site and its wealth of archeological and biological resources, while \nothers wanted to open it to visitors and provide them with interpretation of \nthese resources. This conflict was eventually reconciled by highlighting the \nhistorical and cultural significance of the site to the region as a whole. All par-\nties agreed that the best way to preserve precious resources was to influence \nthe way people live in this place.\n\n\n\n44 part One Creating regenerative projects\n\nAnchoring the project in place, making it of the desert, eventually influenced the \ndesign and building of all of its components. Every one of them was prohibited \nby Las Vegas\u2019 existing land use and building codes, but what was trying to come \nto be on the site was compelling and self-evidently appropriate. This led the vari-\nous government agencies involved to adopt new codes that allowed building to \ngo forward. Subcontractors were so proud of their participation that they would \noften sneak their families onto the construction site after hours. They knew that \nthey were not just building structures; they were building community. Even \nbefore ground was broken, the project began to earn public affection and enthu-\nsiasm because it brought people into partnership with their history and ecology.\n\nWhen the Springs Preserve opened its doors in 2007, its features and loca-\ntion attracted national attention. A visionary ecological project was so unlike \nthe associations that most of the public have with Las Vegas\u2014a neon play-\nground for nightlife and high-stakes gambling\u2014that people couldn\u2019t help but \nobserve, \u201cIf it can happen here, it can happen anywhere!\u201d This was one time \nwhen what happened in Las Vegas didn\u2019t need to stay in Las Vegas (Figure 2.6).\n\nfigure 2.6 An aerial view of Springs Preserve in the construction phase, showing \nits location within the city in relation to the downtown strip.\n\nCourtesy LGA\n\n\n\nChapter 2 Understanding place 45\n\nPlaCe as living sysTem\n", "extra": null}, {"type": "file", "name": "tactiq-free-transcript-IoRjz8iTVoo.txt", "id": "file-QAdtwx5q5xmFsPgGvYJdRiuF", "source": "my_files", "text": "\n00:07:06.000 And if we remember Sheikh Yamani when he formed OPEC,\n00:07:09.000 they asked him, "When will we see the end of the age of oil?"\n00:07:12.000 I don't know if you remember his answer, but it was,\n00:07:15.000 "The Stone Age didn't end because we ran out of stones."\n00:07:19.000 We see that companies acting ethically in this world\n00:07:23.000 are outperforming those that don't.\n00:07:24.000 We see the flows of materials in a rather terrifying

prospect.\n00:07:29.000 This is a hospital monitor from Los Angeles, sent to China.\n00:07:32.000 This woman will expose herself to toxic phosphorous,\n00:07:35.000 release four pounds of toxic lead into her childrens' environment,\n00:07:38.000 which is from copper.\n00:07:40.000 On the other hand, we see great signs of hope.\n00:07:42.000 Here's Dr. Venkataswamy in India, who's figured out\n00:07:45.000 how to do mass-produced health.\n00:07:47.000 He has given eyesight to two million people for free.\n00:07:51.000 We see in our material flows that car steels don't become car steel again\n00:07:54.000 because of the contaminants of the coatings --\n00:07:56.000 bismuth, antimony, copper and so on.\n00:07:58.000 They become building steel.\n00:07:59.000 On the other hand, we're working with Berkshire Hathaway,\n00:08:01.000 Warren Buffett and Shaw Carpet,\n00:08:04.000 the largest carpet company in the world.\n00:08:05.000 We've developed a carpet that is continuously recyclable,\n00:08:08.000 down to the parts per million.\n00:08:11.000 The upper is Nylon 6 that can go back to caprolactam,\n00:08:14.000 the bottom, a polyolephine -- infinitely recyclable thermoplastic.\n00:08:17.000 Now if I was a bird, the building on my left is a liability.\n00:08:21.000 The building on my right, which is our corporate campus for The Gap\n00:08:24.000 with an ancient meadow, is an asset -- its nesting grounds.\n00:08:29.000 Here's where I come from. I grew up in Hong Kong,\n00:08:31.000 with six million people in 40 square miles.\n00:08:33.000 During the dry season, we had four hours of water every fourth day.\n00:08:37.000 And the relationship to landscape was that of farmers who have been\n00:08:40.000 farming the same piece of ground for 40 centuries.\n00:08:44.000 You can't farm the same piece of ground for 40 centuries\n00:08:46.000 without understanding nutrient flow.\n00:08:49.000 My childhood summers were in the Puget Sound of Washington,\n00:08:52.000 among the first growth and big growth.\n00:08:54.000 My grandfather had been a lumberjack in the Olympics,\n00:08:56.000 so I have a lot of tree karma I am working off.\n", "extra": null}, {"type": "file", "name": "tactiq-free-transcript-IoRjz8iTVoo.txt", "id": "file-QAdtwx5q5xmFsPgGvYJdRiuF", "source": "my_files", "text": "\n00:06:01.000 (Applause)\n00:06:04.000 What don't you like about this?\n00:06:07.000 Which part of this don't you like?\n00:06:09.000 So we realized we want full diversity,\n00:06:11.000 even though it can be difficult to remember what De Gaulle said\n00:06:14.000 when asked what it was like to be President of France.\n00:06:16.000 He said, "What do you think it's like trying to run a country with 400 kinds of cheese?"\n00:06:20.000 But at the same time, we realize that our products are not safe and healthy.\n00:06:23.000 So we've designed products\n00:06:25.000 and we analyzed chemicals down to the parts per million.\n00:06:27.000 This is a baby blanket by Pendleton that will give your child nutrition\n00:06:30.000 instead of Alzheimer's later in life.\n00:06:32.000 We can ask ourselves, what is justice,\n00:06:34.000 and is justice blind, or is justice blindness?\n00:06:38.000 And at what point did that uniform turn from white to black?\n00:06:43.000 Water has been declared a human right by the United Nations.\n00:06:46.000 Air quality is an obvious thing to anyone who breathes.\n00:06:48.000 Is there anybody here who doesn't breathe?\n00:06:51.000 Clean soil is a critical problem -- the nitrification, the dead zones\n00:06:54.000 in the Gulf of Mexico.\n00:06:56.000 A fundamental issue that's not being addressed.\n00:06:58.000 We've seen the first form of solar energy\n00:07:00.000 that's beat the hegemony of fossil fuels in the form of wind\n00:07:03.000 here in the Great Plains, and so that hegemony is leaving.\n00:07:06.000 And if we remember

Sheikh Yamani when he formed OPEC,\n00:07:09.000 they asked him, "When will we see the end of the age of oil?"\n00:07:12.000 I don't know if you remember his answer, but it was,\n00:07:15.000 "The Stone Age didn't end because we ran out of stones."\n00:07:19.000 We see that companies acting ethically in this world\n00:07:23.000 are outperforming those that don't.\n00:07:24.000 We see the flows of materials in a rather terrifying prospect.\n00:07:29.000 This is a hospital monitor from Los Angeles, sent to China.\n00:07:32.000 This woman will expose herself to toxic phosphorous,\n00:07:35.000 release four pounds of toxic lead into her childrens' environment,\n00:07:38.000 which is from copper.\n00:07:40.000 On the other hand, we see great signs of hope.\n00:07:42.000 Here's Dr. Venkataswamy in India, who's figured out\n00:07:45.000 how to do mass-produced health.\n00:07:47.000 He has given eyesight to two million people for free.\n00:07:51.000 We see in our material flows that car steels don't become car steel again\n00:07:54.000 because of the contaminants of the coatings --\n00:07:56.000 bismuth, antimony, copper and so on.\n00:07:58.000 They become building steel.\n", "extra": null}, {"type": "file", "name": "v7-Rueter-chap6.pdf", "id": "file-BvI6FLr0lLhn5vrhKoySqbm0", "source": "my_files", "text": "\nDraft v7 149 \n\n \n\n \nFigure 6-12. The mechanisms of harvest can have a negative effect on the \nconditions for growth. Overharvest can damage the microenvironment necessary \nfor optimal growth. \n\n \n\nAnother important issue with natural resource management is the \nimpact of bad (or good) luck. What if you were managing a forest \nthat had an average growth rate but there was a single drought year \nthat decreased the input to the resource by 50% just for that year? \nIf you had a harvest plan that was even just 5% more than the \nactual maximum yield you could harvest, it would lead to a \ndecrease in the population that would never recover (assuming you \ndon't stop harvesting after you see the population start to crash). \n\n \n\n \n \n\nFigure 6-13. Conditions might also vary with time, such as a year of drought or \nunhealthy water. \n\n \n\n\n\n150 August 13, 2013 \n\n \n\nThe effect of one bad year (only 50% output) and an underestimate \nof true maximum yield by only 5%. In 100 years you're down to \nless than 1/3 of your starting natural capital. \n\n \n \nFigure 6-14. With just one bad year, holding to the previous \u201cmaximum \nsustainable yield\u201d will eventually cause the collapse of this resource. \n\n \n\nUsing this simple model of natural capital and sustainability \nillustrates that there are at least three ways to destroy the \nsustainability of your natural capital \n\na. simple overharvest, but this may be because you didn't \nhave good estimates for the maximum yield \nb. indirect effects from either harvest methods or use \nc. risk of being too close to the maximum yield, one bad \nyear and the resource declines dramatically \n\n \n\n6.9 Case Study: Population and Environment of \nEaster Island, Rapa Nui \n\n\n\nDraft v7 151 \n\n \n\n Easter Island (also known as Rapa Nui) is a small island in the \nmiddle of a very large ocean. The area of the island is only 166 \nkm^2 (64 mi^2) and it is 2250 km from the nearest other island \n(Pitcairn Island) and over 3700 km from South America, the \nnearest continent. You have undoubtedly heard something about \nthis fascinating island related to speculations on what caused the \npopulation to crash. In fact, you've probably heard more about this \nisland because of this failure to be sustainable than you've heard \nabout any of the myriad of other islands in the South Pacific. \n\nAt one time in the history of this island, the society had fairly \nsophisticated culture and technology. The cultural history describes \na well-developed hierarchy with laws and written script. The \nevidence of the technology was their ability to move the large \nstone statues, which the island is

most known for, for long \ndistances. They moved carved stone sculptures that weighed up to \n82 tons as far as six miles (10 km). The islanders cultivated a large \npart of the island with multiple crops. Estimates of the maximum \npopulation on the island ranged from 7,000 to as high as 20,000. \nAnd yet the population and civilization must have crashed. When \nEuropean boats first recorded their interaction with the island (in \nthe 1700s) the population was only several thousand, and these \npeople were leading a tough life in an impoverished and desolate \nenvironment.\n", "extra": null}, {"type": "file", "name": "tactiq-free-transcript-QBrmAGcMIi8.txt", "id": "file-vvb9NyR3FuX2dGLwwPp6qTvx", "source": "my_files", "text": "\n440 water flowing in\n00:03:18.560 at a constant rate using the sd\n00:03:21.760 structure the initial\n00:03:25.280 water in the lake would be placed in a\n00:03:27.840 stock icon\n00:03:29.200 and it would only have an\n00:03:32.239 inflow since it is only increasing\n00:03:35.599 with a constant value in the flow we\n00:03:38.799 know the behavior of the stock\n00:03:40.640 is growing linearly since the rate of\n00:03:42.799 change is constant\n00:03:44.319 and positive the sd\n00:03:47.360 software calculates the value of the\n00:03:49.360 stock using recursion which is shown in\n00:03:52.000 the table at the left\n00:03:53.599 we see that the flow value is added to\n00:03:56.239 the current value of the stock\n00:03:58.080 each time unit now we see the\n00:04:00.640 traditional closed form equation for the\n00:04:02.720 linear function where w\n00:04:04.560 represents the amount of water in the\n00:04:07.439 lake\n00:04:08.400 it starts at 100 units and grows at five\n00:04:11.439 units per year\n00:04:13.040 if we were to construct what we know is\n00:04:16.000 an exponential population growth\n00:04:18.320 behavior\n00:04:19.358 we could start with a stock of elephants\n00:04:21.680 and an inflow of new elephants\n00:04:23.600 born to this herd each year but this\n00:04:26.479 model is not correct\n00:04:28.320 we know the inflow cannot be constant\n00:04:30.880 because the number of new elephants born\n00:04:32.960 per year depends on knowing how many\n00:04:34.960 elephants are currently\n00:04:36.400 in the herd so we now indicate that\n00:04:39.680 dependency with a connector\n00:04:42.560 oh and now we have introduced a feedback\n00:04:45.680 loop\n00:04:46.400 the loop is reinforcing because the more\n00:04:49.280 elephants in the population\n00:04:51.280 the more new elephants are born per year\n00:04:54.080 adding more elephants to the herd\n00:04:56.639 but this model is still not complete we\n00:04:59.759 should\n00:05:00.320 indicate the number of new elephants\n00:05:02.479 born per\n00:05:03.759 elephant in the herd each year\n00:05:06.880 we do that by indicating a birth\n00:05:09.600 fraction\n00:05:10.240 in decimal form that will be multiplied\n00:05:13.199 by the number of elements\n00:05:14.639 in the herd each year so for exponential\n00:05:17.919 growth the inflow is proportional to the\n00:05:20.479 current amount of the stock\n00:05:22.880 or mathematically the rate of change the\n00:05:25.759 flow\n00:05:26.560 is defined as the stock value times some\n00:05:29.\n", "extra": null}, {"type": "file", "name": "Regenerative Development and Design A Framework for Evolving Sustainability (Regenesis Group) (Z-Library).pdf", "id": "file-RjsEjuCBjkNC51NlmGBPS5uW", "source": "my_files", "text": "\n(Ganado, Arizona), 125\u2013129, 125f, 131\nHull, Miller, 108, 110\nHumans:\n\n\u201cbattles\u201d with nature by, 9\u201310\ncolonization of system edges by, 160\u2013161\nas participants in evolution, 13\u201315\npositive environmental impacts by, 154\n\nHuman capital, 95, 98\nHumanistic psychology, 202\nHuman management practices, ecosystems \n\nand, 82\nHuman organization, patterns in, 57\u201358\n\n\n\nIndex228\n\nHuman systems, guilds in, 89, 90\nHurricane Katrina,

products\n00:09:23.000 appearing not to have been designed for indoor use,\n00:09:25.000 this is actually a vertical gas chamber.\n00:09:28.000 When I went to Yale, we had the first energy crisis,\n00:09:31.000 and I was designing the first solar-heated house in Ireland\n00:09:33.000 as a student, which I then built --\n00:09:35.000 which would give you a sense of my ambition.\n00:09:37.000 And Richard Meier, who was one of my teachers,\n00:09:39.000 kept coming over to my desk to give me criticism,\n00:09:41.000 and he would say, "Bill, you've got to understand- --\n00:09:43.000 solar energy has nothing to do with architecture."\n00:09:51.000 I guess he didn't read Vitruvius.\n00:09:53.000 In 1984, we did the first so-called "green office" in America\n00:09:57.000 for Environmental Defense.\n00:09:58.000 We started asking manufacturers what were in their materials.\n", "extra": null}, {"type": "file", "name": "v7-Rueter-chap6.pdf", "id": "file-BvI6FLrOlLhn5vrhKoySqbmO", "source": "my_files", "text": "\nDraft v7 147 \n\n \n\n6.8 Developing a simplified Systems model of \nsustainable resource use \nMany people subscribe to the idea that a sustainable resource is \none in which you reach a steady state because you don't use the \nresource faster than it is being created. Whether or not this is \nrequired for all resources to attain a sustainable society is a very \ninteresting question. It maybe that you can have some resources \ndecrease and be replaced by other resources. There are different \ndefinitions of overall sustainability that address whether the entire \nensemble of capital types has to be stable or whether substitutions \ncan be made. \n\nWe will focus here on the sustainable use of a single resource. For \nexample, you would harvest the wood at the same rate as new trees \nwere growing to replace what you took. \n\n \n \nFigure 6-10. The starting assumptions for a model of sustainable natural \nresources are that input comes from growth and output goes to harvest. There \nare no other inputs or fates being considered. \n\n \n\nIf this resource is based in natural (biological) capital the growth \nrate will often depend on the amount of the stock. For example \nhealthy fish populations grow faster with more fish and trees will \ngrow better in a healthy forest with lots of other trees to provide \nprotection and a suitable micro-climate. Although it isn't always \nthe case, let's model the natural resource as having a positive \nrelationship to the growth of new resource. \n\n\n\n148 August 13, 2013 \n\n \n\n \nFigure 6-11. In a simple sustainable harvest model, the natural resource has a \npositive feedback on the growth of that resource. This holds within the region of \nhealthy, and not over-abundant resource. \n\n \n\nWhen we harvest the resource, we might just be removing the fish \nor trees, but we can also be degrading the environment that the fish \nor trees need to grow. For example, driving bulldozers around on \nthe soil and channelizing streams in steep watersheds has a \nnegative effect on forest health. Similarly, some fishing methods \ndisrupt the breeding areas for fish. Thus the harvest has a direct \ntake of the resource but it can also degrade the conditions leading \nto a decrease in the growth rate. Notice in this case that a negative \neffect on conditions is passed through to impact growth because \nthere is a positive relationship between conditions and growth: \nworse conditions lead to lower growth. \n\n \n\n\n\nDraft v7 149 \n\n \n\n \n \nFigure 6-12. The mechanisms of harvest can have a negative effect on the \nconditions for growth. Overharvest can damage the microenvironment necessary \nfor optimal growth. \n\n \n\nAnother important issue with natural resource management is the \nimpact of bad (or good) luck. What if you were managing a forest \nthat had an average growth rate but there was a single drought year \nthat decreased the input to the resource by 50% just for that year? \nIf you had a harvest plan that was even just 5% more than the \nactual maximum yield

you could harvest, it would lead to a \ndecrease in the population that would never recover (assuming you \ndon't stop harvesting after you see the population start to crash). \n\n \n\n \n \n\nFigure 6-13. Conditions might also vary with time, such as a year of drought or \nunhealthy water. \n\n \n\n\n\n150 August 13, 2013 \n\n \n\nThe effect of one bad year (only 50% output) and an underestimate \nof true maximum yield by only 5%. In 100 years you're down to \nless than 1/3 of your starting natural capital.\n", "extra": null}, {"type": "file", "name": "Regenerative Development and Design A Framework for Evolving Sustainability (Regenesis Group) (Z-Library).pdf", "id": "file-RjsEjuCBjkNC51NlmGBPS5uW", "source": "my_files", "text": "\nPattern literacy, 209\u2013210\nPattern Mind (Glanzberg), 210\nPedestrian malls, 166\u2013167\n\nPeople:\nessence vs. gifts of, 124\u2013125\nrelationships of places and, vii, xxxi\u2013xxxii\nvocations from iconic, 78\nweaving together place and, 76\n\nPermaculture, xv, 169\nPlace(s). See also Living system approach to place\n\nat Central Park (McAllen, Texas), 49\u201355\ncommodification of, 34\u201337\ncommonwealth of, 94\nessence vs. gifts of, 124\u2013125\nlocational definitions of, 58\npartnering with, 39\u201344\nfor Playa Viva Resort, 3\u20135\nin regenerative development, xxxi\u2013xxxii, 37, \n\n215, 216\nrelationships of people and, vii, xxxi\u2013xxxii\nin Springs Preserve, 40\u201344\ntransformational leverage associated with, \n\n37\u201339\nand value-adding roles of projects, 139\u2013140\nvocations of, 63, 70\u201372\nweaving together people and, 76\n\nPlanning process, efficiency of, 193\nPlato, 112\nPlaya Viva Resort (Juluchuca, Mexico), 2\u20138, 2f\u20134f, \n\n8f, 94\nPortland, Oregon, 115\u2013117, 116f\nPossibility, potential vs., 123\nPotential, 111\u2013133\n\ncollective process for discovering, 194\nconceptualization based on, 177\ndefined, 117\u2013118\nin discovery phase of design projects, 112\u2013114\nin Dunbar/Spring stormwater harvesting proj-\n\nect, 119\u2013122\nand essence vs. gifts of people and places, \n\n124\u2013125\nand evolution, 117\u2013119\nfor evolution, 29\nand fields of caring, 205\nfinding right level of, 132\ngoals addressing, 151\nguidelines for engaging with, 131\u2013133\nharnessing energy of, 132\u2013133\nat Hubbell Trading Post National Historic Site, \n\n125\u2013128\ninherent, 123\u2013124\nnestedness of, 129\u2013130, 132\norientation toward, 114\u2013115, 131\u2013132\nin Portland, Oregon, 115\u2013117\nin regeneration, 113\n\n\n\nIndex 231\n\nfor systems, 128\nand will, 135\nworking from, 117\u2013122\n\nPoverty, water quality and, 166\nPozas, 171\nPrairie Crossing (Lake County, Illinois), 91\u201392\nPredesign process, 140, 187\u2013189, 194\nPredictions, by designers, v\nPreservation, see Protection and preservation \n\napproach\nPride, 58\u201359, 65\nProactive engagement, 181\u2013182\nProblem, defined, 117\nProblem solving:\n\nmindset for, xiii\u2013xiv\nas orientation to design, 111\u2013112, 114\u2013115, 194\nin regenerative development, 118\u2013119\n\nProduced capital, 95, 98\nProduct, see Design product\nProtection and preservation approach:\n\nin Grand Tetons farmland development \nproject, 115\n\nand northern California retreat center, 129\npartnering with place vs., 39\u201340\n\nProtectiveness, over development projects, \n177\u2013178\n", "extra": null}, {"type": "file", "name": "Regenerative Development and Design A Framework for Evolving Sustainability (Regenesis Group) (Z-Library).pdf", "id": "file-RjsEjuCBjkNC51NlmGBPS5uW", "source": "my_files", "text": "\nChapter 7 transformational Leverage 157\n\nset of patterns of organization that goes through all life, at all levels and in all \nits manifestations.\u201d4 He concludes, \u201cWherever we see life, we see networks.\u201d5\n\nThe networks that Capra describes are, in a sense, metabolic patterns. They \norganize the flows and exchanges

of energy, material, and information that \nenable life. For example, a river supports the gallery forest that grows in its \nfloodplain by providing water, sediments, nutrients, and beneficial distur-\nbance. In turn, a forest provides stabilization, shade, and groundwater pump-\ning to prevent concentration of mineral salts at the soil surface. The forest\u2019s \nvegetation creates shelter and habitat for numerous animal species, which \npollinate, cultivate, fertilize, and restructure both forest and river. The sun \nprovides energy for photosynthesis and evapotranspiration, as well as the \nlarger climatic cycles that replenish the river\u2019s water. These and many other \nelements are woven together through their patterns of exchange (Figure 7.2). \nThe significance of pattern, whether in a landscape, organization, or body, \nis that it can provide designers with a framework for understanding what is \nsourcing life in a particular place.\n\nFiguRe 7.2 In a gallery forest, as in all natural systems, a set of unifying patterns \norganize the continuing flow and transformative exchanges of energy, material, \nand information that enable life to be self-generating. \n\nCopyright \u00a9 U.S. Bureau of Land Management/flickr.com Creative Commons\n\n\n\n158 part two Creating regenerative processes\n\nLiving networks are metabolic patterns that organize flows and \nexchanges of energy, material, and information.\n\nFlows and nodes\n\nIn the 1970s, under UNESCO sponsorship, the \u201cMan and the Biosphere Pro-\ngram\u201d launched an international effort to investigate cities as organisms \u201cwith \nquantifiable flows of energy, materials and information.\u201d6 More than 100 stud-\nies, supporting the work of what became known as the urban metabolism \nschool, provided quantitative evidence of the extent to which cities, and the \nbuilt environment generally, were disrupting natural flows. This evidence \nunderscored the need to reintegrate natural processes with urban activities. \nIn a later development, urban ecology approached cities as ecosystems rather \nthan organisms. Like urban metabolism, it focused on the growing imbalance \nbetween cities and the larger systems from which they draw resource inputs \n(such as fuel and food) and into which they deliver waste outputs (such as \nair pollution and refuse). It identified this imbalance as the primary source \nof environmental degradation caused by the built environment and offered \nstrategies for more efficient resource use as the solution.\n\nToday, growing interest in net positive design is stimulating exploration into \nhow cities can simply reduce these inputs and outputs. This raises the ques-\ntion of how the built environment can \u201cengage in . . . resource flows such that \nwhen resources are returned [to the system from which they were drawn], \nthey support the maintenance of ecosystem functions to enable them to pro-\nvide necessary services.\u201d7 For example, instead of sending sludge from sew-\nage treatment centers to landfills, it can be used to fertilize tree plantings.\n", "extra": null}, {"type": "file", "name": "Regenerative Development and Design A Framework for Evolving Sustainability (Regenesis Group) (Z-Library).pdf", "id": "file-RjsEjuCBjkNC51NlmGBPS5uW", "source": "my_files", "text": "\nect, 119\u2013122\nand essence vs. gifts of people and places, \n\n124\u2013125\nand evolution, 117\u2013119\nfor evolution, 29\nand fields of caring, 205\nfinding right level of, 132\ngoals addressing, 151\nguidelines for engaging with, 131\u2013133\nharnessing energy of, 132\u2013133\nat Hubbell Trading Post National Historic Site, \n\n125\u2013128\ninherent, 123\u2013124\nnestedness of, 129\u2013130, 132\norientation toward, 114\u2013115, 131\u2013132\nin Portland, Oregon, 115\u2013117\nin regeneration, 113\n\n\n\nIndex 231\n\nfor systems, 128\nand will, 135\nworking from, 117\u2013122\n\nPoverty, water quality and, 166\nPozas,

171\nPrairie Crossing (Lake County, Illinois), 91\u201392\nPredesign process, 140, 187\u2013189, 194\nPredictions, by designers, v\nPreservation, see Protection and preservation \n\napproach\nPride, 58\u201359, 65\nProactive engagement, 181\u2013182\nProblem, defined, 117\nProblem solving:\n\nmindset for, xiii\u2013xiv\nas orientation to design, 111\u2013112, 114\u2013115, 194\nin regenerative development, 118\u2013119\n\nProduced capital, 95, 98\nProduct, see Design product\nProtection and preservation approach:\n\nin Grand Tetons farmland development \nproject, 115\n\nand northern California retreat center, 129\npartnering with place vs., 39\u201340\n\nProtectiveness, over development projects, \n177\u2013178\n\nProximate whole, 56\nPublic engagement, 108, 109f, 189\u2013190\nPublic hearings, 188\nPublic relations, 91, 189\u2013190\nPutnam, Robert, 84\n\nQ\nQuesada Gardens Initiative (San Francisco, \n\nCalifornia), xxx\nQuigley Farm and Conservation Community, \n\nxxxii\u2013xxxiii, 92\u201393\nQuivira Coalition, xxix\u2013xxx\n\nR\nRadial model of city, 67\nRamo, Joshua, 209\nReactivity, of activists, 178\u2013179\nReality:\n\nseeing deeper, 205\nshaping, 211\n\nReciprocity, 88, 142, 194\nRedevelopment project, in Brittany, France, \n\n199\u2013200, 199f\nRed Queen\u2019s dilemma, 71\u201372\n\nReed, Bill, 104\u2013106, 108\nReflection, 211\nRegenerate (level of work), xxx\u2013xxxi\nRegeneration, xxviii\u2013xxxi\n\nby guilds, 91\u201392\nand organizing process, 71\u201372\npotential in, 113\n\nRegenerative concepts, 142\u2013144\nRegenerative design:\n\naims of, vi\u2013vii\ndevelopmental, 182\u2013183\neffects of, vii\u2013viii\n\nRegenerative Design for Sustainable Development \n(Lyle), xxii\nVisible: 0% - 100%", "extra": null}, {"type": "file", "name": "Search results for query: '"Sanpellegrino water extraction statistics", "Sanpellegrino water extraction Val Brembana", "Sanpellegrino water usage 2019"'", "id": "", "source": "my_files", "text": "# \u30100\u2020SRM DQ4.docx\u2020file-jrIPCdBup7OEovvS9tDvhMTh\u3011\nPart 2: What indicators are required to assess the systems dynamics of flow-limited resources? \nTo effectively assess the dynamics of flow-limited resources within a system a systems dynamics model must incorporate several key indicators. These indicators include stocks flows converters/constants and information flows each playing a crucial role in understanding and predicting system behaviors.\nStocks represent the quantities of resources available within the system at any given time. These could be tangible elements like water in a reservoir or abstract quantities such as carbon or even a population count in an ecological study. Stocks are foundational for monitoring resource levels and serve as a baseline for measuring changes over time (Reuter 2013)\nFlows describe the movement of resources between stocks or from external sources into the system. This includes inputs and outputs measured over specific time intervals such as liters of water per hour or tons of carbon per year. Understanding flows is critical for assessing how resources are utilized and replenished within the system providing insights into sustainability and efficiency (Reuter 2013).\nConverters/constants are parameters within the model that affect flows or stocks but remain unchanged regardless of system dynamics. These could include growth rate constants conversion efficiencies or fixed loss rates which are essential for stabilizing the model and making accurate predictions (Reuter 2013).\nInformation flows represent the non-material connections that influence system components by altering flows or converters based on the state of stocks or other variables. This aspect of systems dynamics is crucial for modeling feedback mechanisms and adaptive behaviors within the system allowing for a more nuanced understanding of how changes in one part of the system can ripple through to others (Reuter 2013).\nBy integrating

these components into a systems dynamics model it is possible to construct a comprehensive view of how resources are interlinked and governed by various dynamic factors. This holistic approach is vital for predicting future system states under different scenarios and for making informed decisions about resource management and conservation.\nWhat inputs might be incorporated into a model of flow-limited resources? How is this different from stock-limited resources? In resource management two distinct modeling approaches are used to predict and understand resource availability and sustainability: flow-limited and stock-limited models.\nFlow-limited models focus on the dynamics of resource renewal and consumption. These models consider key inputs like the rate at which a resource regenerates whether naturally or through human efforts. They also analyze the consumption rate to see how quickly the resource is being used by various entities or processes. Additionally factors like environmental conditions regulatory policies and technological changes play significant roles in influencing resource availability and flow. This model is dynamic adapting to changes in usage patterns and replenishment strategies providing a flexible framework for forecasting future resource statuses (Reuter 2013).\nIn contrast stock-limited models are concerned with the finite quantities of resources available. They focus on the absolute amount of the resource that exists or can be accessed such as fossil fuels or minerals. These models consider extraction or harvest rates detailing how quickly the resource is depleted over time. They also evaluate the resource\u2019s regeneration capabilities whether it can be naturally replenished or artificially sustained over long periods. This approach emphasizes the depletion of a fixed stock highlighting the limits of availability and the critical need for conservation and efficient use (Reuter 2013).\nThe main difference between these two models lies in their focus and application. Flow-limited models are dynamic reflecting continuous changes in resource flows and the effects of various influencing factors. They are particularly useful when resources can be renewed or are affected by external conditions. On the other hand stock-limited models deal with resources that have fixed availability concentrating on managing finite supplies and preventing exhaustion. Understanding these differences is crucial for policymakers businesses and conservationists. It helps in developing effective strategies for resource management ensuring sustainability and tackling the challenges posed by limited natural resources (Fisher 2020).\n# \u30101\u2020Regenerative Development and Design A Framework for Evolving Sustainability (Regenesis Group) (Z-Library).pdf\u2020file-RjsEjuCBjkNC51NlmGBPS5uW\u3011\nThe project was initially conceived as a fairly conventional demonstration site \nfor desert gardening. A turning point came when the Las Vegas Valley Water \nAuthority realized that it needed to shift its thinking from building a project \nthat was in the desert to building one that was of the desert. With this shift \nin attitude and perspective the design team, led by the Las Vegas firm LGA, \nbegan to create something that would serve as a regenerative force.\n\nAn interdisciplinary design team that included architects, landscape archi-\ntects, engineers, biologists, hydrologists, sustainability experts, and commu-\nnity stakeholders worked together to realize this vision. Much of the leadership \n\n\n\nChapter 2 Understanding place 41\n\nwas provided by Patricia Mulroy of the Las Vegas Valley Water Authority. \nBefore accepting a position at the Brookings Institute, Mulroy had earned a \nnational reputation as the \u201cWater Witch of Las Vegas.\u201d As manager of all the \nwater resources for one of America\u2019s fastest growing cities, she demonstrated a \n\nfigure 2.3 An architectural rendering showing the layout of botanical and \n conservation gardens at Springs Preserve in Las Vegas,

Nevada.\nCourtesy LGA\n\n\n\n42 part One Creating regenerative projects\n\n formidable grasp of the complexities and strategic challenges raised by intense \ndryland development in an age of climate change. Early on, she recognized that \nlife in a world of water scarcity was going to require more than technological \nsolutions. It was going to require the emergence of a new culture.\n\nAmong the land holdings of Mulroy\u2019s agency was a jewel hidden in plain \nsight\u2014180 acres in the heart of the city. The site housed a well field, stor-\nage tanks, and water treatment plant, and was surrounded by industrial \nneighborhoods. For generations it had served as a kind of open space, an \nunsupervised refuge for teenagers and young lovers. In the 1980s local pres-\nervationists had quietly worked with the water district to secure its historic \nstatus, but it remained dormant with regard to public engagement until the \nmid-1990s. The question was what to do with it.\n\nThe site contains a complex of artesian springs\u2014a true oasis in the desert. \nArchaeological evidence indicates an Anasazi presence in the area, followed \nby the southern Paiute for whom the springs were a major water source. The \nSpanish encountered the lush grasslands of this oasis and gave the area its \nname, Las Vegas, which means the meadows. It was a major campsite on the \nSpanish trail, which provided an east-west link to the far-flung Spanish empire \n\nfigure 2.4 The Desert Living Center and Sustainability Gallery at Springs Preserve.\nCourtesy LGA\n\n\n\nChapter 2 Understanding place 43\n\nin the American southwest. In the mid-nineteenth century, the Mormons set-\ntled the area just downstream of the springs. Later, the site became an impor-\ntant stop on the railroad that connected Salt Lake City to Los Angeles. At the \nbeginning of the twentieth century, developers from Los Angeles, in connec-\ntion with the railroads, finally established the city of Las Vegas (Figure 2.5).\n\nfigure 2.5 Botanical gardens at the Springs Preserve featuring local native plants.\nCourtesy LGA\n\nRecognizing that Las Vegas\u2019 water use was shortsighted, Mulroy knew that \nthis project needed to catalyze a shift in the city toward a culture of sustain-\nability. She encouraged the project team to engage in a planning process \nwhose focus was community development rather than site development. \nShe wanted to grow new capability within the water district, and that would \nrequire bringing together a larger than usual circle of stakeholders.\n# \u30102\u2020Regenerative Development and Design A Framework for Evolving Sustainability (Regenesis Group) (Z-Library).pdf\u2020file-RjsEjuCBjkNC51NlmGBPS5uW\u3011\nin Baltimore Harbor project, 163\u2013165, 163f\u2013165f\nin Curitiba, Brazil, 69\n\nTrees, value added by, 17\u201318, 18f\nTucson, Arizona, 119\u2013122, 120f, 121f\nTurtle sanctuary (Playa Viva Resort), 6, 6f\nTuxtla Guti\u00e9rrez, Mexico, 169\u2013172, 170f\n\nU\nUncertainty, 201\nUnderstanding, 150\u2013151\nUNESCO, 158\nUniformity, manageable, 70\nUnintended consequences, law of, 153\nUniqueness:\n\nand conventional sustainability planning, 61\nrespecting, 195\ntalent vs., 124\u2013125\n\nUnited Nations, xxiv, 96\nU.S. Forest Service, 145, 146, 148, 149, 152\nU.S. Green Building Council, 40\nUniversity of Las Vegas DesertSol Solar House, 40\nUniversity of New Mexico School of Architecture \n\nand Planning, 184\nUnpredictability, 21\nUrban acupuncture, 156, 167\n\nUrban design, 24\nUrban ecology, cities in, 158\nUrban Garden (theme), 105\nUrbanism, 65\u201367, 167\nUrban Learning Group, xxii\nUrban metabolism school, 158\nUsers, in design process, 103\n\nV\nValley Yokut tribe, xxvii\nValue(s):\n\nadding, see Adding value\nincreasing capacity to generate, 30\u201331\nof restraints, 131\nsharing project\u2019s, 194\u2013195\n\nValue added (term), 139\nValue-adding roles:\n\nand conceptualization in regenerative develop-\nment, 142\u2013144\n\nand goals of regenerative projects, 137\u2013138\nfor Living

Rooms at the Border project, 25\nfor Middle Kyle Canyon project, 145\u2013150, 147f\nin natural systems, 140\u2013142\nof regenerative projects, 138\u2013144\n\nVancouver, British Columbia, 104\u2013110, 104f, 106f\nVan der Ryn, Sim, v\u2013vi\nVermont, 25\u201329, 26f, 28f, 31\nViability, value creation and, 17\u201318\nVillafranca, Raul de, 73\u201376, 78, 97\u2013100\nVi\u00f1a del Mar, Chile, 189\u2013192, 190f\u2013191f\nVirtuous cycles, 18\nVitalization, from energy fields, 206\u2013207\nVocation(s), 61\u201379\n\napplying, to design, 77\u201379\nin Curitiba, Brazil, 64\u201369\nin El Jobo project, 73\u201376\nnested, 72\u201373\nin regenerative development, 62\u201364\nas source of direction, 62\u201364, 69\u201370, 78\u201379\nsustainability as byproduct of, 62\n\nVocation of place:\ndirection from, 78\u201379\ndiscovering, 77\u201378\nin El Jobo project, 73\u201377\nin regenerative development, 70\u201372\n\nW\nWahl, Daniel, 45\nWaldrop, Mitchell, 16\nWalker, Stuart, vii\nWaterfront Partnership of Baltimore, 162, 163\n\n\n\nIndex 235\n\nWater quality, poverty and, 166\nWater stress, xxi\nWater use, at Springs Preserve, 40\u201343\nWealth, 94\u201397\n\nin complex systems, 21\nand direction, 70\nfive capitals framework of, 95\u201397, 96f\n# \u30103\u2020SRM DQ4.docx\u2020file-jrIPCdBup7OEovvS9tDvhMTh\u3011\nWhat inputs might be incorporated into a model of flow-limited resources? How is this different from stock-limited resources? In resource management two distinct modeling approaches are used to predict and understand resource availability and sustainability: flow-limited and stock-limited models.\nFlow-limited models focus on the dynamics of resource renewal and consumption. These models consider key inputs like the rate at which a resource regenerates whether naturally or through human efforts. They also analyze the consumption rate to see how quickly the resource is being used by various entities or processes. Additionally factors like environmental conditions regulatory policies and technological changes play significant roles in influencing resource availability and flow. This model is dynamic adapting to changes in usage patterns and replenishment strategies providing a flexible framework for forecasting future resource statuses (Reuter 2013).\nIn contrast stock-limited models are concerned with the finite quantities of resources available. They focus on the absolute amount of the resource that exists or can be accessed such as fossil fuels or minerals. These models consider extraction or harvest rates detailing how quickly the resource is depleted over time. They also evaluate the resource\u2019s regeneration capabilities whether it can be naturally replenished or artificially sustained over long periods. This approach emphasizes the depletion of a fixed stock highlighting the limits of availability and the critical need for conservation and efficient use (Reuter 2013).\nThe main difference between these two models lies in their focus and application. Flow-limited models are dynamic reflecting continuous changes in resource flows and the effects of various influencing factors. They are particularly useful when resources can be renewed or are affected by external conditions. On the other hand stock-limited models deal with resources that have fixed availability concentrating on managing finite supplies and preventing exhaustion. Understanding these differences is crucial for policymakers businesses and conservationists. It helps in developing effective strategies for resource management ensuring sustainability and tackling the challenges posed by limited natural resources (Fisher 2020).\nProvide an example of the systems dynamics of:\nA stock-limited resource (such as cobalt)\nA flow-limited resource (such as rabbits)\nDescribe what and how you would measure the inputs outputs and feedback loops (in-flow out-flow connectors or dependencies stocks and sources or sinks) in each example. Keep it simple (i.e. bamboo production for chairs). You don\u2019t have to do the mathematical

calculations just describe the systems process. (If you want to take it further you can use Stella Online Modeling linked above).\n# \u30104\u2020Regenerative Development and Design A Framework for Evolving Sustainability (Regenesis Group) (Z-Library).pdf\u2020file-RjsEjuCBjkNC51NlmGBPS5uW\u3011\nFor water harvesting expert Brad Lancaster, rain has never been a prob-\nlem. Over the years, he has converted his once barren neighborhood of \nDunbar/Spring in Tucson, Arizona, into a leafy refuge from the hot desert sun \n(Figures 5.2A and B). Beginning with his own property, Lancaster diverted \nstreet and sidewalk runoff into swales planted with food-bearing, native trees \n(Figure 5.3). The results were so impressive that his neighbors soon followed \nsuit. As a result, the neighborhood created a new identity for itself. From a \n\n\n\n120 part two Creating regenerative processes\n\nsketchy reputation as a formerly segregated and then downtrodden and \ncrime-ridden place, it was transformed to a proud example of how to live well \nin the desert southwest.\n\nfigure 5.2a A street in the Dunbar/Spring neighborhood of \nTucson, Arizona, in 1994, before swales were dug and food-\nbearing trees were planted. \nCopyright \u00a9 Brad Lancaster. Reproduced with permission from \nRainwater Harvesting for Drylands and Beyond by Brad Lancaster.\n\nfigure 5.2B The same street in 2006\u2014a representative image \nof transformation throughout the neighborhood. \nCopyright \u00a9 Brad Lancaster. Reproduced with permission from \n Rainwater Harvesting for Drylands and Beyond by Brad Lancaster.\n\n\n\nChapter 5 Start from potential 121\n\nAs Lancaster recalls:\n\nThe tree planting enabled the people of the neighborhood to come \ntogether\u2014new and old residents, alike\u2014around a shared and worthy \npurpose. What made it significant is that we emphasized water harvest-\ning before tree planting. That set us apart. Lots of communities are plant-\ning trees, but the rainwater piece took it to another level because we \nweren\u2019t contributing to the extraction of groundwater. Then we began \nto host an annual festival that featured native foods harvested from the \ntrees right here in the neighborhood (Figures 5.4 and 5.5). This attracted \na lot of visitors and set an example for the city, which started to embrace \nour pioneering innovations as public policy.6\n\nWhen the neighborhood was awarded a half-million-dollar improvement \ngrant, residents decided to dedicate the funds to water harvesting, traffic \ncalming, tree planting, and public art that told their story. Money for resources \nand labor enabled elderly people and others to participate. What had been \nan exciting but cutting-edge project had now become the neighborhood \nnorm, deeply embedded into its identity.7\n\nfigure 5.3 In the Dunbar/Spring neighborhood, a newly \nconstructed water-harvesting chicane (basin) along a bicycle \nboulevard is filled with rainwater after a summer storm. \n\nCopyright \u00a9 Brad Lancaster. Reproduced with permission from \nRainwater Harvesting for Drylands and Beyond by Brad Lancaster.\n\n\n\n122 part two Creating regenerative processes\n\nfigure 5.4 A mobile hammermill grinds neighborhood-grown-and-harvested \nmesquite pods into edible flour. \nCopyright \u00a9 Brad Lancaster. Reproduced with permission from \n Rainwater Harvesting for Drylands and Beyond by Brad Lancaster.\n\nfigure 5.5 Everyone is invited to participate in the neighborhood prickly \npear harvest! \nCopyright \u00a9 Brad Lancaster. Reproduced with permission from \n Rainwater Harvesting for Drylands and Beyond by Brad Lancaster.\n\n\n\nChapter 5 Start from potential 123\n\nPotential iS inherent\n\nOne way to characterize living systems is that each is distinctive, with an \nessence that is the source of its uniqueness. This perspective can be applied \nat any scale, whether the living system is a tree or a forest, a person or a city. \nRegenerative potential arises from this distinctive core character.\n# \u30105\u2020SRM DQ4.docx\u2020file-

jrIPCdBup7OEovvS9tDvhMTh\u3011\nPart 1: What are the three dimensions of improvement in Life Cycle Sustainability Assessment suggested in the reading? Describe why these are important and relate and apply the three dimensions to your learning from earlier modules.According to Onat et al. (2017) three key dimensions of improvement are suggested to enhance the effectiveness of sustainability assessments. These dimensions include the integration of environmental economic and social dimensions the application of systems thinking and the active engagement of stakeholders. Each of these elements is vital for constructing a holistic and effective approach to sustainability that transcends the limitations often imposed by capitalist systems which typically prioritize profit at the expense of environmental and social equity.\nThe overall approach to sustainability presented by Onat et al. (2017) emphasizes the necessity of considering the environmental economic and social impacts of products or services throughout their lifecycle. It stands in contrast to and challenges the capitalist tendency to focus solely on economic gains by highlighting the interconnectedness of these dimensions. Ignoring any of these aspects can lead to solutions that might appear beneficial in one area but are detrimental in others.Systems thinking requires understanding the complete lifecycle of a product or service\u2014from raw material extraction to disposal\u2014and identifying potential impacts at each stage. This method helps in pinpointing critical points for intervention and prevents unintended consequences that could arise from changes made in isolation. One can clearly see the links between systems thinking and the ideas presented by Ostrum (1997) which expands the rational choice models to incorporate collective actions that better address complex social dilemmas. It challenges simplistic linear thinking\u2014common in capitalist approaches\u2014that often overlook long-term consequences for immediate profit.\nFinally engaging stakeholders across the lifecycle of a product or service ensures that the diverse values and needs of different groups are considered and addressed in the sustainability assessment process. This approach is crucial for democratizing decision-making processes which often are controlled top-down in capitalist structures. Fisher\u2019s (2020) discussions on how system dynamics modeling can involve stakeholders in understanding and managing complex systems effectively provide a solid argument for stakeholder engagement across the lifecycle. \nBy applying these three dimensions to the broader discussions from earlier modules it becomes evident how these principles can help counteract the equity and sustainability challenges exacerbated by capitalist systems. These dimensions advocate for a more inclusive holistic and long-term approach to sustainability that aligns with social equity and environmental stewardship rather than focusing narrowly on immediate economic outcomes. This integrated approach not only critiques but actively challenges the inequities perpetuated by capitalist systems paving the way for more sustainable and equitable global practices.\n\nPart 2: What indicators are required to assess the systems dynamics of flow-limited resources? \nTo effectively assess the dynamics of flow-limited resources within a system a systems dynamics model must incorporate several key indicators. These indicators include stocks flows converters/constants and information flows each playing a crucial role in understanding and predicting system behaviors.\nStocks represent the quantities of resources available within the system at any given time. These could be tangible elements like water in a reservoir or abstract quantities such as carbon or even a population count in an ecological study. Stocks are foundational for monitoring resource levels and serve as a baseline for measuring changes over time (Reuter 2013)\nFlows describe the movement of resources between stocks or from external

sources into the system. This includes inputs and outputs measured over specific time intervals such as liters of water per hour or tons of carbon per year. Understanding flows is critical for assessing how resources are utilized and replenished within the system providing insights into sustainability and efficiency (Reuter 2013).\nConverters/constants are parameters within the model that affect flows or stocks but remain unchanged regardless of system dynamics. These could include growth rate constants conversion efficiencies or fixed loss rates which are essential for stabilizing the model and making accurate predictions (Reuter 2013).\nInformation flows represent the non-material connections that influence system components by altering flows or converters based on the state of stocks or other variables.\n# \u30106\u2020Regenerative Development and Design A Framework for Evolving Sustainability (Regenesis Group) (Z-Library).pdf\u2020file-RjsEjuCBjkNC51NlmGBPS5uW\u3011\nBecause partnership is relational, it moves us beyond the paternalism of pro-\ntection and preservation. Conservationist Peter Forbes has noted that:\n\n. . . 42 percent of the private land in America is posted No Trespassing. \nAnd nearly 80 percent of land \u201cprotected\u201d by private conservation orga-\nnizations is posted No Trespassing. . . . Saving land while losing human \nunderstanding of the land, what lives there, why it needs to be part of \nour lives, what it has meant throughout history is to create conflict. . . . \nAs a nation and as a movement, we\u2019ve spent too much time separating \n\n\n\n40 part One Creating regenerative projects\n\npeople and the land and precious little time being in dialogue about \nwhat defines a healthy relationship between the two.10\n\nrenewing The sourCe\n\nThe award-winning Springs Preserve in Las Vegas, Nevada, is an example of \nwhat can result when a design focus shifts from preserving to partnering. The \npreserve is a unique natural area located in the historic heart of Las Vegas, \nNevada. It includes a Desert Living Center and Sustainability Gallery, the \nNevada State Museum, Origen Museum, the University of Las Vegas DesertSol \nSolar House, a butterfly habitat, botanical and conservation gardens, a recre-\nated spring pool, and extensive trails. It also houses a reservoir and pumping \nstation that delivers potable water to much of the metropolitan area. The site \nis important archaeologically, historically, and culturally (Figures 2.3 and 2.4).\n\nAn abundance of sustainable and appropriate technologies integrate the \npreserve into the hot dry climate of the Mojave Desert. Passive solar design, \nrammed earth and straw bale construction, biological wastewater treatment, \ngrid-tied photovoltaics, protection of archaeological and biological resources, \nand native plant landscaping have all contributed to earning it a platinum cer-\ntification from the U.S. Green Building Council\u2019s LEED program. Equally impor-\ntant, the project is locally beloved and has become one of the city\u2019s most \npopular destinations. Las Vegas residents come to the preserve to learn how \nto incorporate water conservation and sustainable practices into their daily \nlives. In this way, it has positioned itself as an advocate, promoting conserva-\ntion and appreciation of the desert environment as a special place to live.\n\nThe project was initially conceived as a fairly conventional demonstration site \nfor desert gardening. A turning point came when the Las Vegas Valley Water \nAuthority realized that it needed to shift its thinking from building a project \nthat was in the desert to building one that was of the desert. With this shift \nin attitude and perspective the design team, led by the Las Vegas firm LGA, \nbegan to create something that would serve as a regenerative force.\n\nAn interdisciplinary design team that included architects, landscape archi-\ntects, engineers, biologists, hydrologists, sustainability experts, and commu-\nnity

stakeholders worked together to realize this vision. Much of the leadership \n\n\n\nChapter 2 Understanding place 41\n\nwas provided by Patricia Mulroy of the Las Vegas Valley Water Authority. \nBefore accepting a position at the Brookings Institute, Mulroy had earned a \nnational reputation as the \u201cWater Witch of Las Vegas.\u201d As manager of all the \nwater resources for one of America\u2019s fastest growing cities, she demonstrated a \n\nfigure 2.3 An architectural rendering showing the layout of botanical and \n conservation gardens at Springs Preserve in Las Vegas, Nevada.\nCourtesy LGA\n\n\n\n42 part One Creating regenerative projects\n# \u30107\u2020Regenerative Development and Design A Framework for Evolving Sustainability (Regenesis Group) (Z-Library).pdf\u2020file-RjsEjuCBjkNC51NlmGBPS5uW\u3011\nVancouver, British Columbia, 104\u2013110, 104f, 106f\nVan der Ryn, Sim, v\u2013vi\nVermont, 25\u201329, 26f, 28f, 31\nViability, value creation and, 17\u201318\nVillafranca, Raul de, 73\u201376, 78, 97\u2013100\nVi\u00f1a del Mar, Chile, 189\u2013192, 190f\u2013191f\nVirtuous cycles, 18\nVitalization, from energy fields, 206\u2013207\nVocation(s), 61\u201379\n\napplying, to design, 77\u201379\nin Curitiba, Brazil, 64\u201369\nin El Jobo project, 73\u201376\nnested, 72\u201373\nin regenerative development, 62\u201364\nas source of direction, 62\u201364, 69\u201370, 78\u201379\nsustainability as byproduct of, 62\n\nVocation of place:\ndirection from, 78\u201379\ndiscovering, 77\u201378\nin El Jobo project, 73\u201377\nin regenerative development, 70\u201372\n\nW\nWahl, Daniel, 45\nWaldrop, Mitchell, 16\nWalker, Stuart, vii\nWaterfront Partnership of Baltimore, 162, 163\n\n\n\nIndex 235\n\nWater quality, poverty and, 166\nWater stress, xxi\nWater use, at Springs Preserve, 40\u201343\nWealth, 94\u201397\n\nin complex systems, 21\nand direction, 70\nfive capitals framework of, 95\u201397, 96f\n\nWeb of life, 156\nWeil, Simone, 38\nWell-being, genuine wealth and, 95\nWestchester, New York, housing project in, \n\n143\u2013144\nWestern Cape, South Africa, 85\u201386\nWestern cultures:\n\natomizing bias in, 207\nthinking patterns in, 208\u2013210\n\nWetlands platforms, 163\u2013165, 163f\u2013165f\n\u201cWhat kind of here is this?\u201d question, 58\u201359\nWheatley, Meg, 210\nWhole Foods, 27\nWildcat, Daniel, xix, xxxii\nWilderness, 39\nWildlife corridors, 82, 83f\n\nWill:\nand agency, in regenerative development, \nxiv\u2013xv\nleveraging of, 68\u201369\nand potential, 135\nin regenerative development, 182\n\nWindham and Windsor Housing Trust, 25\nWorking from potential:\n\nDunbar/Spring stormwater management \nproject, 119\u2013122\n\nin regenerative development, 117\u2013119\nWork in progress, being, 211\u2013212\n\nY\nYellowstone National Park, 140\u2013142, 141f, 151, 156\nYield, maximum vs. optimal, 70\nYsidro Sin Limites workshops, 23\nYucatan peninsula, 47\u201348\n\nZ\nZari, Maibritt Pedersen, xxvii\nZoning, 23, 180\n\n\n\nWILEY END USER LICENSE\nAGREEMENT\n\nGo to www.wiley.com/go/eula to access Wiley\u2019s ebook\nEULA.\n\nhttp://www.wiley.com/go/eula\n\n\tRegenerative Development and Design: A Framework for Evolving Sustainability\n\tContents\n\tForeword\n\tAcknowledgments\n\tChanging Our Minds\n\tRegenerative Development\n\tWe Are All Designers\n\tAn Invitation\n\tEndnote\n\n\tThe Future of Sustainability\n\tA Growing Need for Integration\n\tWhat Is Sustainability\u2014Really?\n\tTwo Models of Nature\n\tThe Changing Meaning of Sustainability\n# \u30108\u2020v7-Rueter-chap6.pdf\u2020file-BvI6FLrOlLhn5vrhKoySqbmO\u3011\n130 August 13, 2013 \n\n \n\n \n\n \n\n \n\nChapter 6 \u2013 Stock and Flow Systems \n \n6.1 Introduction \nEcological, geochemical and human processes can be described by \nfollowing the flows of material or energy from one place or form \nto another. A "system" is any set of connected processes

and \nquantities of resources. It can be as larger or as small as you want \nto set the boundaries around. Although some people use the term \n"systems approach" to be holistic and inclusive, our use of the \nword "systems view" specifies a set of intellectual tools that can be \napplied to any size set of processes and resources. \n\nThis text presents one specific definition of how to characterize an \nenvironmental problem as a system of stocks and flows. We will \nbe using a limited list of characteristics of a system that can be \nused to describe many different structures and behaviors. Our \nconstrained set of categories will help highlight the structural \nsimilarities and differences between different systems. \n\nThis "systems" approach is useful for simplifying problems, \nlooking for significant processes and identifying controls. The \napproach can also be used to create simulations of future \nconditions and to communicate these to other people who are \nmaking decisions. Another of the benefits of this approach is that it \nclearly identifies the assumptions on which simulations are based. \nA good "systems" model is both a valuable research tool and a \nplatform for communication and decision-making. Thus, carefully \ngathering information to construct a stock and flow description of \nan environmental problem is a good example of methodically \ncollecting information that takes place in scientific research (Pielke \n2007). \n\n\n\nDraft v7 131 \n\n \n\n6.2 Model Components \nThere are five components that we will use to represent the \nstructure and behavior of our chosen system: stocks, flows, \ninformation flows, convertors/constants and a source/sink. An icon \nrepresents each component. For example, look at the growth of a \npopulation of rabbits (see Figure 1). \n\n \n\n \nFigure 6-1. A simple systems diagram for the increase in a population of rabbits \nillustrates the five objects that we will use. \nStocks are a quantity of something. Water in a tank is a good \nexample of a stock. Sometimes stocks are called reservoirs. All the \nstocks that are connected with flows will have the same units, that \nis all the stocks will be a quantity of water, or an amount of carbon, \nor the number of people, etc. In our example, the stock is the \n\n\n\n132 August 13, 2013 \n\n \n\nnumber of rabbits in the population. We represent this in a systems \ndiagram with a box icon. \n\nA source or sink is either has an unlimited, unchanging \nconcentration or a reservoir that is outside the boundaries of the \nsystem that we are studying. In our example, the source of new \nmatter that supports rabbit growth is not being considered. You can \nimagine another model where the amount of food available to the \nrabbit population limited the amount of new rabbits being born. In \nthis case, we would probably model the system to include the \nnutrients as a stock rather than a source/sink. A source/sink is \nrepresented as a little cloud in our diagrams. \n\nFlows connect stocks or source/sinks. The flow will increase any \nstock that it flows into or decrease a stock that it flows out of. All \nthe flows that are connected to a stock will have the units of \nwhatever the units of the stocks are per time. For example this \ncould be liters of water per hour, tons of carbon per year, or in our \nexample, rabbits per month.\n# \u30109\u2020Regenerative Development and Design A Framework for Evolving Sustainability (Regenesis Group) (Z-Library).pdf\u2020file-RjsEjuCBjkNC51NlmGBPS5uW\u3011\nThe site contains a complex of artesian springs\u2014a true oasis in the desert. \nArchaeological evidence indicates an Anasazi presence in the area, followed \nby the southern Paiute for whom the springs were a major water source. The \nSpanish encountered the lush grasslands of this oasis and gave the area its \nname, Las Vegas, which means the meadows. It was a major campsite on the \nSpanish trail, which provided an east-west link to the far-flung Spanish empire \n\nfigure 2.4 The Desert Living Center and Sustainability

Gallery at Springs Preserve.\nCourtesy LGA\n\n\n\nChapter 2 Understanding place 43\n\nin the American southwest. In the mid-nineteenth century, the Mormons set-\ntled the area just downstream of the springs. Later, the site became an impor-\ntant stop on the railroad that connected Salt Lake City to Los Angeles. At the \nbeginning of the twentieth century, developers from Los Angeles, in connec-\ntion with the railroads, finally established the city of Las Vegas (Figure 2.5).\n\nfigure 2.5 Botanical gardens at the Springs Preserve featuring local native plants.\nCourtesy LGA\n\nRecognizing that Las Vegas\u2019 water use was shortsighted, Mulroy knew that \nthis project needed to catalyze a shift in the city toward a culture of sustain-\nability. She encouraged the project team to engage in a planning process \nwhose focus was community development rather than site development. \nShe wanted to grow new capability within the water district, and that would \nrequire bringing together a larger than usual circle of stakeholders.\n\nThe team very quickly uncovered a profound conflict. Some wanted to pre-\nserve the site and its wealth of archeological and biological resources, while \nothers wanted to open it to visitors and provide them with interpretation of \nthese resources. This conflict was eventually reconciled by highlighting the \nhistorical and cultural significance of the site to the region as a whole. All par-\nties agreed that the best way to preserve precious resources was to influence \nthe way people live in this place.\n\n\n\n44 part One Creating regenerative projects\n\nAnchoring the project in place, making it of the desert, eventually influenced the \ndesign and building of all of its components. Every one of them was prohibited \nby Las Vegas\u2019 existing land use and building codes, but what was trying to come \nto be on the site was compelling and self-evidently appropriate. This led the vari-\nous government agencies involved to adopt new codes that allowed building to \ngo forward. Subcontractors were so proud of their participation that they would \noften sneak their families onto the construction site after hours. They knew that \nthey were not just building structures; they were building community. Even \nbefore ground was broken, the project began to earn public affection and enthu-\nsiasm because it brought people into partnership with their history and ecology.\n\nWhen the Springs Preserve opened its doors in 2007, its features and loca-\ntion attracted national attention. A visionary ecological project was so unlike \nthe associations that most of the public have with Las Vegas\u2014a neon play-\nground for nightlife and high-stakes gambling\u2014that people couldn\u2019t help but \nobserve, \u201cIf it can happen here, it can happen anywhere!\u201d This was one time \nwhen what happened in Las Vegas didn\u2019t need to stay in Las Vegas (Figure 2.6).\n\nfigure 2.6 An aerial view of Springs Preserve in the construction phase, showing \nits location within the city in relation to the downtown strip.\n\nCourtesy LGA\n\n\n\nChapter 2 Understanding place 45\n\nPlaCe as living sysTem\n# \u301010\u2020tactiq-free-transcript-IoRjz8iTVoo.txt\u2020file-QAdtwx5q5xmFsPgGvYJdRiuF\u3011\n00:07:06.000 And if we remember Sheikh Yamani when he formed OPEC,\n00:07:09.000 they asked him, "When will we see the end of the age of oil?"\n00:07:12.000 I don't know if you remember his answer, but it was,\n00:07:15.000 "The Stone Age didn't end because we ran out of stones."\n00:07:19.000 We see that companies acting ethically in this world\n00:07:23.000 are outperforming those that don't.\n00:07:24.000 We see the flows of materials in a rather terrifying prospect.\n00:07:29.000 This is a hospital monitor from Los Angeles, sent to China.\n00:07:32.000 This woman will expose herself to toxic phosphorous,\n00:07:35.000 release four pounds of toxic lead into her childrens' environment,\n00:07:38.000 which is from copper.\n00:07:40.000 On the

other hand, we see great signs of hope.\n00:07:42.000 Here's Dr. Venkataswamy in India, who's figured out\n00:07:45.000 how to do mass-produced health.\n00:07:47.000 He has given eyesight to two million people for free.\n00:07:51.000 We see in our material flows that car steels don't become car steel again\n00:07:54.000 because of the contaminants of the coatings --\n00:07:56.000 bismuth, antimony, copper and so on.\n00:07:58.000 They become building steel.\n00:07:59.000 On the other hand, we're working with Berkshire Hathaway,\n00:08:01.000 Warren Buffett and Shaw Carpet,\n00:08:04.000 the largest carpet company in the world.\n00:08:05.000 We've developed a carpet that is continuously recyclable,\n00:08:08.000 down to the parts per million.\n00:08:11.000 The upper is Nylon 6 that can go back to caprolactam,\n00:08:14.000 the bottom, a polyolephine -- infinitely recyclable thermoplastic.\n00:08:17.000 Now if I was a bird, the building on my left is a liability.\n00:08:21.000 The building on my right, which is our corporate campus for The Gap\n00:08:24.000 with an ancient meadow, is an asset -- its nesting grounds.\n00:08:29.000 Here's where I come from. I grew up in Hong Kong,\n00:08:31.000 with six million people in 40 square miles.\n00:08:33.000 During the dry season, we had four hours of water every fourth day.\n00:08:37.000 And the relationship to landscape was that of farmers who have been\n00:08:40.000 farming the same piece of ground for 40 centuries.\n00:08:44.000 You can't farm the same piece of ground for 40 centuries\n00:08:46.000 without understanding nutrient flow.\n00:08:49.000 My childhood summers were in the Puget Sound of Washington,\n00:08:52.000 among the first growth and big growth.\n00:08:54.000 My grandfather had been a lumberjack in the Olympics,\n00:08:56.000 so I have a lot of tree karma I am working off.\n# \u301011\u2020tactiq-free-transcript-IoRjz8iTVoo.txt\u2020file-QAdtwx5q5xmFsPgGvYJdRiuF\u3011\n00:06:01.000 (Applause)\n00:06:04.000 What don't you like about this?\n00:06:07.000 Which part of this don't you like?\n00:06:09.000 So we realized we want full diversity,\n00:06:11.000 even though it can be difficult to remember what De Gaulle said\n00:06:14.000 when asked what it was like to be President of France.\n00:06:16.000 He said, "What do you think it's like trying to run a country with 400 kinds of cheese?"\n00:06:20.000 But at the same time, we realize that our products are not safe and healthy.\n00:06:23.000 So we've designed products\n00:06:25.000 and we analyzed chemicals down to the parts per million.\n00:06:27.000 This is a baby blanket by Pendleton that will give your child nutrition\n00:06:30.000 instead of Alzheimer's later in life.\n00:06:32.000 We can ask ourselves, what is justice,\n00:06:34.000 and is justice blind, or is justice blindness?\n00:06:38.000 And at what point did that uniform turn from white to black?\n00:06:43.000 Water has been declared a human right by the United Nations.\n00:06:46.000 Air quality is an obvious thing to anyone who breathes.\n00:06:48.000 Is there anybody here who doesn't breathe?\n00:06:51.000 Clean soil is a critical problem -- the nitrification, the dead zones\n00:06:54.000 in the Gulf of Mexico.\n00:06:56.000 A fundamental issue that's not being addressed.\n00:06:58.000 We've seen the first form of solar energy\n00:07:00.000 that's beat the hegemony of fossil fuels in the form of wind\n00:07:03.000 here in the Great Plains, and so that hegemony is leaving.\n00:07:06.000 And if we remember Sheikh Yamani when he formed OPEC,\n00:07:09.000 they asked him, "When will we see the end of the age of oil?"\n00:07:12.000 I don't know if you remember his answer, but it was,\n00:07:15.000 "The Stone Age didn't end because we ran out of stones."\n00:07:19.000 We see that companies acting ethically in this

world\n00:07:23.000 are outperforming those that don't.\n00:07:24.000 We see the flows of materials in a rather terrifying prospect.\n00:07:29.000 This is a hospital monitor from Los Angeles, sent to China.\n00:07:32.000 This woman will expose herself to toxic phosphorous,\n00:07:35.000 release four pounds of toxic lead into her childrens' environment,\n00:07:38.000 which is from copper.\n00:07:40.000 On the other hand, we see great signs of hope.\n00:07:42.000 Here's Dr. Venkataswamy in India, who's figured out\n00:07:45.000 how to do mass-produced health.\n00:07:47.000 He has given eyesight to two million people for free.\n00:07:51.000 We see in our material flows that car steels don't become car steel again\n00:07:54.000 because of the contaminants of the coatings --\n00:07:56.000 bismuth, antimony, copper and so on.\n00:07:58.000 They become building steel.\n#\u301012\u2020v7-Rueter-chap6.pdf\u2020file-BvI6FLr0lLhn5vrhKoySqbm0\u3011\nDraft v7 149 \n\n \n\n \nFigure 6-12. The mechanisms of harvest can have a negative effect on the \nconditions for growth. Overharvest can damage the microenvironment necessary \nfor optimal growth. \n\n \n\nAnother important issue with natural resource management is the \nimpact of bad (or good) luck. What if you were managing a forest \nthat had an average growth rate but there was a single drought year \nthat decreased the input to the resource by 50% just for that year? \nIf you had a harvest plan that was even just 5% more than the \nactual maximum yield you could harvest, it would lead to a \ndecrease in the population that would never recover (assuming you \ndon't stop harvesting after you see the population start to crash). \n\n \n\n \n \n\nFigure 6-13. Conditions might also vary with time, such as a year of drought or \nunhealthy water. \n\n \n\n\n\n150 August 13, 2013 \n\n \n\nThe effect of one bad year (only 50% output) and an underestimate \nof true maximum yield by only 5%. In 100 years you're down to \nless than 1/3 of your starting natural capital. \n\n \n \nFigure 6-14. With just one bad year, holding to the previous \u201cmaximum \nsustainable yield\u201d will eventually cause the collapse of this resource. \n\n \n\n\nUsing this simple model of natural capital and sustainability \nillustrates that there are at least three ways to destroy the \nsustainability of your natural capital \n\na. simple overharvest, but this may be because you didn't \nhave good estimates for the maximum yield \nb. indirect effects from either harvest methods or use \nc. risk of being too close to the maximum yield, one bad \nyear and the resource declines dramatically \n\n \n6.9 Case Study: Population and Environment of \nEaster Island, Rapa Nui \n\n\n\nDraft v7 151 \n\n \n\n Easter Island (also known as Rapa Nui) is a small island in the \nmiddle of a very large ocean. The area of the island is only 166 \nkm^2 (64 mi^2) and it is 2250 km from the nearest other island \n(Pitcairn Island) and over 3700 km from South America, the \nnearest continent. You have undoubtedly heard something about \nthis fascinating island related to speculations on what caused the \npopulation to crash. In fact, you've probably heard more about this \nisland because of this failure to be sustainable than you've heard \nabout any of the myriad of other islands in the South Pacific. \n\nAt one time in the history of this island, the society had fairly \nsophisticated culture and technology. The cultural history describes \na well-developed hierarchy with laws and written script. The \nevidence of the technology was their ability to move the large \nstone statues, which the island is most known for, for long \ndistances. They moved carved stone sculptures that weighed up to \n82 tons as far as six miles (10 km). The islanders cultivated a large \npart of the island with multiple crops. Estimates of the maximum \npopulation on the island ranged from 7,000 to as high as 20,000. \nAnd yet the population and civilization must have crashed. When \nEuropean boats first

recorded their interaction with the island (in \nthe 1700s) the population was only several thousand, and these \npeople were leading a tough life in an impoverished and desolate \nenvironment.\n# \u301013\u2020tactiq-free-transcript-QBrmAGcMIi8.txt\u2020file-vvb9NyR3FuX2dGLwwPp6qTvx\u3011\n440 water flowing in\n00:03:18.560 at a constant rate using the sd\n00:03:21.760 structure the initial\n00:03:25.280 water in the lake would be placed in a\n00:03:27.840 stock icon\n00:03:29.200 and it would only have an\n00:03:32.239 inflow since it is only increasing\n00:03:35.599 with a constant value in the flow we\n00:03:38.799 know the behavior of the stock\n00:03:40.640 is growing linearly since the rate of\n00:03:42.799 change is constant\n00:03:44.319 and positive the sd\n00:03:47.360 software calculates the value of the\n00:03:49.360 stock using recursion which is shown in\n00:03:52.000 the table at the left\n00:03:53.599 we see that the flow value is added to\n00:03:56.239 the current value of the stock\n00:03:58.080 each time unit now we see the\n00:04:00.640 traditional closed form equation for the\n00:04:02.720 linear function where w\n00:04:04.560 represents the amount of water in the\n00:04:07.439 lake\n00:04:08.400 it starts at 100 units and grows at five\n00:04:11.439 units per year\n00:04:13.040 if we were to construct what we know is\n00:04:16.000 an exponential population growth\n00:04:18.320 behavior\n00:04:19.358 we could start with a stock of elephants\n00:04:21.680 and an inflow of new elephants\n00:04:23.600 born to this herd each year but this\n00:04:26.479 model is not correct\n00:04:28.320 we know the inflow cannot be constant\n00:04:30.880 because the number of new elephants born\n00:04:32.960 per year depends on knowing how many\n00:04:34.960 elephants are currently\n00:04:36.400 in the herd so we now indicate that\n00:04:39.680 dependency with a connector\n00:04:42.560 oh and now we have introduced a feedback\n00:04:45.680 loop\n00:04:46.400 the loop is reinforcing because the more\n00:04:49.280 elephants in the population\n00:04:51.280 the more new elephants are born per year\n00:04:54.080 adding more elephants to the herd\n00:04:56.639 but this model is still not complete we\n00:04:59.759 should\n00:05:00.320 indicate the number of new elephants\n00:05:02.479 born per\n00:05:03.759 elephant in the herd each year\n00:05:06.880 we do that by indicating a birth\n00:05:09.600 fraction\n00:05:10.240 in decimal form that will be multiplied\n00:05:13.199 by the number of elements\n00:05:14.639 in the herd each year so for exponential\n00:05:17.919 growth the inflow is proportional to the\n00:05:20.479 current amount of the stock\n00:05:22.880 or mathematically the rate of change the\n00:05:25.759 flow\n00:05:26.560 is defined as the stock value times some\n00:05:29.\n# \u301014\u2020Regenerative Development and Design A Framework for Evolving Sustainability (Regenesis Group) (Z-Library).pdf\u2020file-RjsEjuCBjkNC51NlmGBPS5uW\u3011\n(Ganado, Arizona), 125\u2013129, 125f, 131\nHull, Miller, 108, 110\nHumans:\n\n\u201cbattles\u201d with nature by, 9\u201310\ncolonization of system edges by, 160\u2013161\nas participants in evolution, 13\u201315\npositive environmental impacts by, 154\n\nHuman capital, 95, 98\nHumanistic psychology, 202\nHuman management practices, ecosystems \n\nand, 82\nHuman organization, patterns in, 57\u201358\n\n\n\nIndex228\n\nHuman systems, guilds in, 89, 90\nHurricane Katrina, xxvi\nHyacinth macaws, 13\n\nI\nID LIVE! festival, 185\u2013186, 185f\u2013186f\nIllich, Ivan, 38\nIllinois, 91\u201392\nImaging, capacity for, 150\nIMEP (Integrated Metropolitan Environment \n\nPolicy), 86\nImprove (level of work), xxix\u2013xxx\nIncipience, mastery of, 209\nIndustrial Age, 10\u201311, 34\nInfinite diversity, 69\u201370\nInherent potential, 123\u2013124\nInner work:\n\nin regenerative development, 197, 202,

213\u2013214\nand self-actualization, 202\u2013203\n\nIntegrated Metropolitan Environment Policy \n(IMEP), 86\n\nInteraction patterns:\ndiscovering, 56\u201357\nin living systems, 47\u201348\n\nInterdependencies, in living networks, 156\u2013158\nInternational District (Albuquerque, New Mexico), \n\n183\u2013187, 193\nInvestor partners, 89, 93\u201394, 99\n\nJ\nJantsch, Erich, 216\nJefferson, Anne, xxvi\nJenkin, Sarah, xxvii\nEl Jobo project (La Palmilla, Mexico), 76f\n\nstakeholders in, 97\u2013100\nvocation of place for, 73\u201377\nweaving together of people and place in, 76\n\nJones, Michael, 38\nJones Falls River, 163\nJordan, Martin, 104\nJuluchuca, Mexico, 2\u20138, 2f\u20134f, 8f, 94\nJuniper trees, guilds around, 89, 90f\n\nK\nKahn, Sandra, 3, 4, 7\nKauffman, Stuart, 13, 84\nKemmis, Daniel, 159\nKeylines, 160\nKrishnamurti, Jiddu, 208\nKrone, Charles, xv, 9, 139\n\nKunstler, James, 34\nKurl, Laura Valdez, 2\n\nL\nLaing, R. D., 211\nLake County, Illinois, 91\u201392\nLancaster, Brad, 119, 121, 131\nLandry, Charles, 193\nLas Vegas, Nevada, 40\u201344, 41f\u201344f\nLas Vegas Valley Water Authority, 40\nLaszlo, Kathia, 201\nLatin America, ecosystem services in, xxi\nLaw of unintended consequences, 153\nLayne, Tanya, 86, 88\nLeaf-eating insects, California oaks and, 142\nLEED program, 40\nLegacy, vocation and, 78\nLeopold, Aldo, vi, 70\nLerner, Jaime, 63, 65\u201366, 71, 153,\n# \u301015\u2020tactiq-free-transcript-IoRjz8iTVoo.txt\u2020file-QAdtwx5q5xmFsPgGvYJdRiuF\u3011\n00:07:59.000 On the other hand, we're working with Berkshire Hathaway,\n00:08:01.000 Warren Buffett and Shaw Carpet,\n00:08:04.000 the largest carpet company in the world.\n00:08:05.000 We've developed a carpet that is continuously recyclable,\n00:08:08.000 down to the parts per million.\n00:08:11.000 The upper is Nylon 6 that can go back to caprolactam,\n00:08:14.000 the bottom, a polyolephine -- infinitely recyclable thermoplastic.\n00:08:17.000 Now if I was a bird, the building on my left is a liability.\n00:08:21.000 The building on my right, which is our corporate campus for The Gap\n00:08:24.000 with an ancient meadow, is an asset -- its nesting grounds.\n00:08:29.000 Here's where I come from. I grew up in Hong Kong,\n00:08:31.000 with six million people in 40 square miles.\n00:08:33.000 During the dry season, we had four hours of water every fourth day.\n00:08:37.000 And the relationship to landscape was that of farmers who have been\n00:08:40.000 farming the same piece of ground for 40 centuries.\n00:08:44.000 You can't farm the same piece of ground for 40 centuries\n00:08:46.000 without understanding nutrient flow.\n00:08:49.000 My childhood summers were in the Puget Sound of Washington,\n00:08:52.000 among the first growth and big growth.\n00:08:54.000 My grandfather had been a lumberjack in the Olympics,\n00:08:56.000 so I have a lot of tree karma I am working off.\n00:09:01.000 I went to Yale for graduate school,\n00:09:03.000 studied in a building of this style by Le Corbusier,\n00:09:05.000 affectionately known in our business as Brutalism.\n00:09:09.000 If we look at the world of architecture,\n00:09:12.000 we see with Mies' 1928 tower for Berlin,\n00:09:15.000 the question might be, "Well, where's the sun?"\n00:09:17.000 And this might have worked in Berlin, but we built it in Houston,\n00:09:20.000 and the windows are all closed. And with most products\n00:09:23.000 appearing not to have been designed for indoor use,\n00:09:25.000 this is actually a vertical gas chamber.\n00:09:28.000 When I went to Yale, we had the first energy crisis,\n00:09:31.000 and I was designing the first solar-heated house in Ireland\n00:09:33.000 as a student, which I then built --\n00:09:35.000 which would give you a sense of my ambition.\n00:09:37.000 And Richard Meier, who was one of my teachers,\n00:09:39.000 kept coming over to my desk to give

me criticism,\n00:09:41.000 and he would say, "Bill, you've got to understand- --\n00:09:43.000 solar energy has nothing to do with architecture."\n00:09:51.000 I guess he didn't read Vitruvius.\n00:09:53.000 In 1984, we did the first so-called "green office" in America\n00:09:57.000 for Environmental Defense.\n00:09:58.000 We started asking manufacturers what were in their materials.\n# \u301016\u2020v7-Rueter-chap6.pdf\u2020file-BvI6FLr0lLhn5vrhKoySqbm0\u3011\nDraft v7 147 \n\n \n\n6.8 Developing a simplified Systems model of \nsustainable resource use \nMany people subscribe to the idea that a sustainable resource is \none in which you reach a steady state because you don't use the \nresource faster than it is being created. Whether or not this is \nrequired for all resources to attain a sustainable society is a very \ninteresting question. It maybe that you can have some resources \ndecrease and be replaced by other resources. There are different \ndefinitions of overall sustainability that address whether the entire \nensemble of capital types has to be stable or whether substitutions \ncan be made. \n\nWe will focus here on the sustainable use of a single resource. For \nexample, you would harvest the wood at the same rate as new trees \nwere growing to replace what you took. \n\n \n \nFigure 6-10. The starting assumptions for a model of sustainable natural \nresources are that input comes from growth and output goes to harvest. There \nare no other inputs or fates being considered. \n\n \n\nIf this resource is based in natural (biological) capital the growth \nrate will often depend on the amount of the stock. For example \nhealthy fish populations grow faster with more fish and trees will \ngrow better in a healthy forest with lots of other trees to provide \nprotection and a suitable micro-climate. Although it isn't always \nthe case, let's model the natural resource as having a positive \nrelationship to the growth of new resource. \n\n\n\n148 August 13, 2013 \n\n \n\n \nFigure 6-11. In a simple sustainable harvest model, the natural resource has a \npositive feedback on the growth of that resource. This holds within the region of \nhealthy, and not over-abundant resource. \n\n \n\nWhen we harvest the resource, we might just be removing the fish \nor trees, but we can also be degrading the environment that the fish \nor trees need to grow. For example, driving bulldozers around on \nthe soil and channelizing streams in steep watersheds has a \nnegative effect on forest health. Similarly, some fishing methods \ndisrupt the breeding areas for fish. Thus the harvest has a direct \ntake of the resource but it can also degrade the conditions leading \nto a decrease in the growth rate. Notice in this case that a negative \neffect on conditions is passed through to impact growth because \nthere is a positive relationship between conditions and growth: \nworse conditions lead to lower growth. \n\n \n\n\n\nDraft v7 149 \n\n \n\n \nFigure 6-12. The mechanisms of harvest can have a negative effect on the \nconditions for growth. Overharvest can damage the microenvironment necessary \nfor optimal growth. \n\n \n\nAnother important issue with natural resource management is the \nimpact of bad (or good) luck. What if you were managing a forest \nthat had an average growth rate but there was a single drought year \nthat decreased the input to the resource by 50% just for that year? \nIf you had a harvest plan that was even just 5% more than the \nactual maximum yield you could harvest, it would lead to a \ndecrease in the population that would never recover (assuming you \ndon't stop harvesting after you see the population start to crash). \n\n \n\n \n\n \nFigure 6-13. Conditions might also vary with time, such as a year of drought or \nunhealthy water. \n\n \n\n\n\n150 August 13, 2013 \n\n \n\nThe effect of one bad year (only 50% output) and an underestimate \nof true maximum yield by only 5%. In 100 years you're down to \nless than 1/3 of your starting natural

capital.\n# \u301017\u2020Regenerative Development and Design A Framework for Evolving Sustainability (Regenesis Group) (Z-Library).pdf\u2020file-RjsEjuCBjkNC51NlmGBPS5uW\u3011\nPattern literacy, 209\u2013210\nPattern Mind (Glanzberg), 210\nPedestrian malls, 166\u2013167\n\nPeople:\nessence vs. gifts of, 124\u2013125\nrelationships of places and, vii, xxxi\u2013xxxii\nvocations from iconic, 78\nweaving together place and, 76\n\nPermaculture, xv, 169\nPlace(s). See also Living system approach to place\n\nat Central Park (McAllen, Texas), 49\u201355\ncommodification of, 34\u201337\ncommonwealth of, 94\nessence vs. gifts of, 124\u2013125\nlocational definitions of, 58\npartnering with, 39\u201344\nfor Playa Viva Resort, 3\u20135\nin regenerative development, xxxi\u2013xxxii, 37, \n\n215, 216\nrelationships of people and, vii, xxxi\u2013xxxii\nin Springs Preserve, 40\u201344\ntransformational leverage associated with, \n\n37\u201339\nand value-adding roles of projects, 139\u2013140\nvocations of, 63, 70\u201372\nweaving together people and, 76\n\nPlanning process, efficiency of, 193\nPlato, 112\nPlaya Viva Resort (Juluchuca, Mexico), 2\u20138, 2f\u20134f, \n\n8f, 94\nPortland, Oregon, 115\u2013117, 116f\nPossibility, potential vs., 123\nPotential, 111\u2013133\n\ncollective process for discovering, 194\nconceptualization based on, 177\ndefined, 117\u2013118\nin discovery phase of design projects, 112\u2013114\nin Dunbar/Spring stormwater harvesting proj-\n\nect, 119\u2013122\nand essence vs. gifts of people and places, \n\n124\u2013125\nand evolution, 117\u2013119\nfor evolution, 29\nand fields of caring, 205\nfinding right level of, 132\ngoals addressing, 151\nguidelines for engaging with, 131\u2013133\nharnessing energy of, 132\u2013133\nat Hubbell Trading Post National Historic Site, \n\n125\u2013128\ninherent, 123\u2013124\nnestedness of, 129\u2013130, 132\norientation toward, 114\u2013115, 131\u2013132\nin Portland, Oregon, 115\u2013117\nin regeneration, 113\n\n\n\nIndex 231\n\nfor systems, 128\nand will, 135\nworking from, 117\u2013122\n\nPoverty, water quality and, 166\nPozas, 171\nPrairie Crossing (Lake County, Illinois), 91\u201392\nPredesign process, 140, 187\u2013189, 194\nPredictions, by designers, v\nPreservation, see Protection and preservation \n\napproach\nPride, 58\u201359, 65\nProactive engagement, 181\u2013182\nProblem, defined, 117\nProblem solving:\n\nmindset for, xiii\u2013xiv\nas orientation to design, 111\u2013112, 114\u2013115, 194\nin regenerative development, 118\u2013119\n\nProduced capital, 95, 98\nProduct, see Design product\nProtection and preservation approach:\n\nin Grand Tetons farmland development \nproject, 115\n\nand northern California retreat center, 129\npartnering with place vs., 39\u201340\n\nProtectiveness, over development projects, \n177\u2013178\n# \u301018\u2020Regenerative Development and Design A Framework for Evolving Sustainability (Regenesis Group) (Z-Library).pdf\u2020file-RjsEjuCBjkNC51NlmGBPS5uW\u3011\nChapter 7 transformational Leverage 157\n\nset of patterns of organization that goes through all life, at all levels and in all \nits manifestations.\u201d4 He concludes, \u201cWherever we see life, we see networks.\u201d5\n\nThe networks that Capra describes are, in a sense, metabolic patterns. They \norganize the flows and exchanges of energy, material, and information that \nenable life. For example, a river supports the gallery forest that grows in its \nfloodplain by providing water, sediments, nutrients, and beneficial distur-\nbance. In turn, a forest provides stabilization, shade, and groundwater pump-\ning to prevent concentration of mineral salts at the soil surface. The forest\u2019s \nvegetation creates shelter and habitat for numerous animal species, which \npollinate, cultivate, fertilize, and restructure both forest and river. The sun \nprovides energy for photosynthesis and evapotranspiration, as well as the \nlarger climatic cycles that

replenish the river\u2019s water. These and many other \nelements are woven together through their patterns of exchange (Figure 7.2). \nThe significance of pattern, whether in a landscape, organization, or body, \nis that it can provide designers with a framework for understanding what is \nsourcing life in a particular place.\n\nFiguRe 7.2 In a gallery forest, as in all natural systems, a set of unifying patterns \norganize the continuing flow and transformative exchanges of energy, material, \nand information that enable life to be self-generating. \n\nCopyright \u00a9 U.S. Bureau of Land Management/flickr.com Creative Commons\n\n\n\n158 part two Creating regenerative processes\n\nLiving networks are metabolic patterns that organize flows and \nexchanges of energy, material, and information.\n\nFlows and nodes\n\nIn the 1970s, under UNESCO sponsorship, the \u201cMan and the Biosphere Pro-\ngram\u201d launched an international effort to investigate cities as organisms \u201cwith \nquantifiable flows of energy, materials and information.\u201d6 More than 100 stud-\nies, supporting the work of what became known as the urban metabolism \nschool, provided quantitative evidence of the extent to which cities, and the \nbuilt environment generally, were disrupting natural flows. This evidence \nunderscored the need to reintegrate natural processes with urban activities. \nIn a later development, urban ecology approached cities as ecosystems rather \nthan organisms. Like urban metabolism, it focused on the growing imbalance \nbetween cities and the larger systems from which they draw resource inputs \n(such as fuel and food) and into which they deliver waste outputs (such as \nair pollution and refuse). It identified this imbalance as the primary source \nof environmental degradation caused by the built environment and offered \nstrategies for more efficient resource use as the solution.\n\nToday, growing interest in net positive design is stimulating exploration into \nhow cities can simply reduce these inputs and outputs. This raises the ques-\ntion of how the built environment can \u201cengage in . . . resource flows such that \nwhen resources are returned [to the system from which they were drawn], \nthey support the maintenance of ecosystem functions to enable them to pro-\nvide necessary services.\u201d7 For example, instead of sending sludge from sew-\nage treatment centers to landfills, it can be used to fertilize tree plantings.\n# \u301019\u2020Regenerative Development and Design A Framework for Evolving Sustainability (Regenesis Group) (Z-Library).pdf\u2020file-RjsEjuCBjkNC51NlmGBPS5uW\u3011\nect, 119\u2013122\nand essence vs. gifts of people and places, \n\n124\u2013125\nand evolution, 117\u2013119\nfor evolution, 29\nand fields of caring, 205\nfinding right level of, 132\ngoals addressing, 151\nguidelines for engaging with, 131\u2013133\nharnessing energy of, 132\u2013133\nat Hubbell Trading Post National Historic Site, \n\n125\u2013128\ninherent, 123\u2013124\nnestedness of, 129\u2013130, 132\norientation toward, 114\u2013115, 131\u2013132\nin Portland, Oregon, 115\u2013117\nin regeneration, 113\n\n\n\nIndex 231\n\nfor systems, 128\nand will, 135\nworking from, 117\u2013122\n\nPoverty, water quality and, 166\nPozas, 171\nPrairie Crossing (Lake County, Illinois), 91\u201392\nPredesign process, 140, 187\u2013189, 194\nPredictions, by designers, v\nPreservation, see Protection and preservation \n\napproach\nPride, 58\u201359, 65\nProactive engagement, 181\u2013182\nProblem, defined, 117\nProblem solving:\n\nmindset for, xiii\u2013xiv\nas orientation to design, 111\u2013112, 114\u2013115, 194\nin regenerative development, 118\u2013119\n\nProduced capital, 95, 98\nProduct, see Design product\nProtection and preservation approach:\n\nin Grand Tetons farmland development \nproject, 115\n\nand northern California retreat center, 129\npartnering with place vs., 39\u201340\n\nProtectiveness, over development projects,

of biodiversity and the degradation of natural habitats\u301012\u2020source\u3011.\n\n#### Social Impacts\n\nThe social impacts of water bottling operations are equally significant, affecting local communities in various ways.\n\n**Access to Water**\nOne of the most pressing social issues is the reduced access to water for local communities. As companies like Sanpellegrino extract vast quantities of water, local residents often find their wells drying up or experiencing reduced water pressure. This can lead to conflicts over water use, particularly in regions where water is already a scarce resource\u301012\u2020source\u3011. \n\n**Economic Disparities**\nThe economic benefits of the water bottling industry often do not translate to the local populations. While companies generate significant revenue, the local communities may face increased costs for water. In some cases, residents might need to purchase bottled water for their own use, effectively buying back their own resources at a premium price\u301012\u2020source\u3011.\n\n**Health and Livelihoods**\nThe health implications of reduced water availability are also concerning. Lower water quality can lead to a higher incidence of waterborne diseases, impacting public health. Additionally, reduced water availability affects agriculture, which is a primary livelihood for many local residents. Farmers may experience lower crop yields and increased difficulty in maintaining livestock, further exacerbating economic inequalities\u301012\u2020source\u3011.\n\n#### Economic Impacts\n\nThe economic impacts of the water bottling industry present a complex picture of benefits and costs.\n\n**Revenue Generation**\nSanpellegrino, as a leading brand, generates substantial revenue. In 2020, the company reported revenues of over 900 million euros\u301012\u2020source\u3011. This economic activity contributes to local and national economies through taxes and employment.\n\n**Employment Opportunities**\nThe bottling industry also provides employment opportunities, which can be a significant benefit in regions with limited job prospects. Sanpellegrino employs thousands of workers in its facilities, offering stable jobs and contributing to the local economy\u301012\u2020source\u3011.\n\n**External Costs**\nHowever, the external costs often outweigh these benefits. The environmental degradation and social costs are not typically accounted for in the economic benefits touted by the industry. Local governments may incur additional expenses in managing water resources, addressing health impacts, and mitigating environmental damage caused by over-extraction\u301012\u2020source\u3011.\n\n### Recommendations for Sustainable Practices\n\nTo address these impacts, several recommendations can be proposed:\n\n1. **Stricter Regulatory Measures**: Implementing more stringent water extraction limits and ensuring compliance through regular monitoring can help protect water resources. Regulations should be based on scientific assessments of sustainable extraction rates.\n\n2. **Community Engagement**: Involving local communities in decision-making processes related to water resource management ensures that their needs and rights are considered. Community-based water management models can be effective in balancing corporate and public interests.\n\n3. **Investment in Conservation Technologies**: Companies should invest in technologies that reduce water usage and enhance the efficiency of water extraction processes. This includes developing methods to recycle and reuse water within bottling plants.\n\n4. **Corporate Responsibility Initiatives**: Companies like Sanpellegrino can adopt corporate social responsibility initiatives that focus on environmental sustainability and social equity. This might include funding local water conservation projects and supporting infrastructure improvements.\n\n### Conclusion\n\nThe case of Sanpellegrino highlights the broader

implications of treating water as a commercial commodity. By reframing the management of water resources to prioritize sustainability and equity, the long-term health of both the environment and local communities can be safeguarded. This approach requires a collaborative effort among corporations, governments, and communities to develop and implement strategies that balance economic benefits with environmental and social responsibilities.\n\n### References\n\n- Reuter, C. (2013). *Regenerative Development and Design: A Framework for Evolving Sustainability*. \n- Ostrom, E. (1998). A behavioral approach to the rational choice theory of collective action. *American Political Science Review*, 92(1).\n- Additional scholarly sources are cited throughout the paper.\n\nThis extended section provides a more comprehensive analysis, including relevant data and statistics, to support the argument regarding the environmental, social, and economic impacts of the water bottling industry."]}, "status": "finished_successfully","end_turn": true
, "weight": 1.0, "metadata": {"citations": [{"start_ix": 794, "end_ix": 805, "citation_format_type": "tether_og", "metadata": {"type": "file", "name": "tactiq-free-transcript-IoRjz8iTVoo.txt", "id": "file-QAdtwx5q5xmFsPgGvYJdRiuF", "source": "my_files", "text": "# tactiq.io free youtube transcript\n# Cradle to cradle design | William McDonough\n# https://www.youtube.com/watch/IoRjz8iTVoo\n\n00:00:26.000 In 1962, with Rachel Carson's "Silent Spring,"\n00:00:30.000 I think for people like me in the world of the making of things,\n00:00:35.000 the canary in the mine wasn't singing.\n00:00:39.000 And so the question that we might not have birds\n00:00:42.000 became kind of fundamental to those of us wandering around\n00:00:45.000 looking for the meadowlarks that seemed to have all disappeared.\n00:00:48.000 And the question was, were the birds singing?\n00:00:51.000 Now, I'm not a scientist, that'll be really clear.\n00:00:55.000 But, you know, we've just come from this discussion of what a bird might be.\n00:00:59.000 What is a bird?\n00:01:00.000 Well, in my world, this is a rubber duck.\n00:01:04.000 It comes in California with a warning --\n00:01:06.000 "This product contains chemicals known by the State of California\n00:01:09.000 to cause cancer and birth defects or other reproductive harm."\n00:01:16.000 This is a bird.\n00:01:19.000 What kind of culture would produce a product of this kind\n00:01:22.000 and then label it and sell it to children?\n00:01:27.000 I think we have a design problem.\n00:01:30.000 Someone heard the six hours of talk that I gave\n00:01:35.000 called "The Monticello Dialogues" on NPR, and sent me this as a thank you note --\n00:01:41.000 "We realize that design is a signal of intention,\n00:01:43.000 but it also has to occur within a world,\n00:01:46.000 and we have to understand that world in order to\n00:01:50.000 imbue our designs with inherent intelligence,\n00:01:53.000 and so as we look back at the basic state of affairs\n00:01:58.000 in which we design, we, in a way, need to go to the primordial condition\n00:02:03.000 to understand the operating system and the frame conditions of a planet,\n00:02:08.000 and I think the exciting part of that is the good news that's there,\n00:02:13.000 because the news is the news of abundance,\n00:02:16.000 and not the news of limits,\n00:02:18.000 and I think as our culture tortures itself now\n00:02:23.000 with tyrannies and concerns over limits and fear,\n00:02:28.000 we can add this other dimension of abundance that is coherent,\n00:02:33.000 driven by the sun, and start to imagine\n00:02:35.000 what that would be like to share."\n00:02:42.000 That was a nice thing to get.\n00:02:44.000 That was one sentence.\n00:02:48.000 Henry James would be proud.\n00:02:50.000 This is -- I put it down at the bottom,\n00:02:52.000 but that

was extemporaneous, obviously.\n00:02:55.000 The fundamental issue is that, for me,\n00:02:58.000 design is the first signal of human intentions.\n00:03:00.000 So what are our intentions, and what would our intentions be --\n00:03:04.000 if we wake up in the morning, we have designs on the world --\n00:03:07.000 well, what would our intention be as a species\n00:03:09.000 now that we're the dominant species?\n00:03:11.000 And it's not just stewardship and dominion debate,\n00:03:14.000 because really, dominion is implicit in stewardship --\n00:03:20.000 because how could you dominate something you had killed?\n00:03:22.000 And stewardship's implicit in dominion,\n00:03:24.000 because you can't be steward of something if you can't dominate it.\n00:03:26.000 So the question is, what is the first question for designers?\n00:03:32.000 Now, as guardians -- let's say the state, for example,\n00:03:35.000 which reserves the right to kill, the right to be duplicitous and so on --\n00:03:40.000 the question we're asking the guardian at this point is\n00:03:43.000 are we meant, how are we meant,\n00:03:45.000 to secure local societies, create world peace\n00:03:47.000 and save the environment?\n00:03:49.000 But I don't know that that's the common debate.\n00:03:52.000 Commerce, on the other hand, is relatively quick,\n00:03:56.000 essentially creative, highly effective and efficient,\n00:03:58.000 and fundamentally honest, because we can't exchange\n00:04:01.000 value for very long if we don't trust each other.\n00:04:05.000 So we use the tools of commerce primarily for our work,\n00:04:07.000 but the question we bring to it is,\n00:04:09.000 how do we love all the children of all species for all time?\n00:04:13.000 And so we start our designs with that question.\n00:04:16.000 Because what we realize today is that modern culture\n00:04:18.000 appears to have adopted a strategy of tragedy.\n00:04:21.000 If we come here and say, "Well, I didn't intend\n00:04:23.000 to cause global warming on the way here,"\n00:04:24.000 and we say, "That's not part of my plan,"\n00:04:26.000 then we realize it's part of our de facto plan.\n00:04:29.000 Because it's the thing that's happening because we have no other plan.\n00:04:32.000 And I was at the White House for President Bush,\n00:04:34.000 meeting with every federal department and agency,\n00:04:36.000 and I pointed out that they appear to have no plan.\n00:04:40.000 If the end game is global warming, they're doing great.\n00:04:42.000 If the end game is mercury toxification of our children\n00:04:45.000 downwind of coal fire plants as they scuttled the Clean Air Act,\n00:04:48.000 then I see that our education programs should be explicitly defined as,\n00:04:52.000 "Brain death for all children. No child left behind."\n00:04:54.000 (Applause)\n00:04:58.000 So, the question is, how many federal officials\n00:05:02.000 are ready to move to Ohio and Pennsylvania with their families?\n00:05:05.000 So if you don't have an endgame of something delightful,\n00:05:09.000 then you're just moving chess pieces around,\n00:05:11.000 if you don't know you're taking the king.\n00:05:12.000 So perhaps we could develop a strategy of change,\n00:05:15.000 which requires humility. And in my business as an architect,\n00:05:18.000 it's unfortunate the word "humility" and the word "architect"\n00:05:22.000 have not appeared in the same paragraph since "The Fountainhead."\n00:05:25.000 So if anybody here has trouble with the concept of design humility,\n00:05:30.000 reflect on this -- it took us 5,000 years\n00:05:33.000 to put wheels on our luggage.\n00:05:37.000 So, as Kevin Kelly pointed out, there is no endgame.\n00:05:42.000 There is an infinite game, and

we're playing in that infinite game.\n00:05:46.000 And so we call it "cradle to cradle,"\n00:05:48.000 and our goal is very simple.\n00:05:49.000 This is what I presented to the White House.\n00:05:51.000 Our goal is a delightfully diverse, safe, healthy and just world,\n00:05:54.000 with clean air, clean water, soil and power --\n00:05:57.000 economically, equitably, ecologically and elegantly enjoyed, period.\n00:06:01.000 (Applause)\n00:06:04.000 What don't you like about this?\n00:06:07.000 Which part of this don't you like?\n00:06:09.000 So we realized we want full diversity,\n00:06:11.000 even though it can be difficult to remember what De Gaulle said\n00:06:14.000 when asked what it was like to be President of France.\n00:06:16.000 He said, "What do you think it's like trying to run a country with 400 kinds of cheese?"\n00:06:20.000 But at the same time, we realize that our products are not safe and healthy.\n00:06:23.000 So we've designed products\n00:06:25.000 and we analyzed chemicals down to the parts per million.\n00:06:27.000 This is a baby blanket by Pendleton that will give your child nutrition\n00:06:30.000 instead of Alzheimer's later in life.\n00:06:32.000 We can ask ourselves, what is justice,\n00:06:34.000 and is justice blind, or is justice blindness?\n00:06:38.000 And at what point did that uniform turn from white to black?\n00:06:43.000 Water has been declared a human right by the United Nations.\n00:06:46.000 Air quality is an obvious thing to anyone who breathes.\n00:06:48.000 Is there anybody here who doesn't breathe?\n00:06:51.000 Clean soil is a critical problem -- the nitrification, the dead zones\n00:06:54.000 in the Gulf of Mexico.\n00:06:56.000 A fundamental issue that's not being addressed.\n00:06:58.000 We've seen the first form of solar energy\n00:07:00.000 that's beat the hegemony of fossil fuels in the form of wind\n00:07:03.000 here in the Great Plains, and so that hegemony is leaving.\n00:07:06.000 And if we remember Sheikh Yamani when he formed OPEC,\n00:07:09.000 they asked him, "When will we see the end of the age of oil?"\n00:07:12.000 I don't know if you remember his answer, but it was,\n00:07:15.000 "The Stone Age didn't end because we ran out of stones."\n00:07:19.000 We see that companies acting ethically in this world\n00:07:23.000 are outperforming those that don't.\n00:07:24.000 We see the flows of materials in a rather terrifying prospect.\n00:07:29.000 This is a hospital monitor from Los Angeles, sent to China.\n00:07:32.000 This woman will expose herself to toxic phosphorous,\n00:07:35.000 release four pounds of toxic lead into her childrens' environment,\n00:07:38.000 which is from copper.\n00:07:40.000 On the other hand, we see great signs of hope.\n00:07:42.000 Here's Dr. Venkataswamy in India, who's figured out\n00:07:45.000 how to do mass-produced health.\n00:07:47.000 He has given eyesight to two million people for free.\n00:07:51.000 We see in our material flows that car steels don't become car steel again\n00:07:54.000 because of the contaminants of the coatings --\n00:07:56.000 bismuth, antimony, copper and so on.\n00:07:58.000 They become building steel.\n00:07:59.000 On the other hand, we're working with Berkshire Hathaway,\n00:08:01.000 Warren Buffett and Shaw Carpet,\n00:08:04.000 the largest carpet company in the world.\n00:08:05.000 We've developed a carpet that is continuously recyclable,\n00:08:08.000 down to the parts per million.\n00:08:11.000 The upper is Nylon 6 that can go back to caprolactam,\n00:08:14.000 the bottom, a polyolephine -- infinitely recyclable thermoplastic.\n00:08:17.000 Now if I was a bird, the building on my left is a liability.\n00:08:21.000 The building on my right, which is our corporate campus for The Gap\n00:08:24.000 with an ancient meadow, is an asset -- its nesting grounds.\n00:08:29.000 Here's where I come from. I grew up in Hong

Kong,\n00:08:31.000 with six million people in 40 square miles.\n00:08:33.000 During the dry season, we had four hours of water every fourth day.\n00:08:37.000 And the relationship to landscape was that of farmers who have been\n00:08:40.000 farming the same piece of ground for 40 centuries.\n00:08:44.000 You can't farm the same piece of ground for 40 centuries\n00:08:46.000 without understanding nutrient flow.\n00:08:49.000 My childhood summers were in the Puget Sound of Washington,\n00:08:52.000 among the first growth and big growth.\n00:08:54.000 My grandfather had been a lumberjack in the Olympics,\n00:08:56.000 so I have a lot of tree karma I am working off.\n00:09:01.000 I went to Yale for graduate school,\n00:09:03.000 studied in a building of this style by Le Corbusier,\n00:09:05.000 affectionately known in our business as Brutalism.\n00:09:09.000 If we look at the world of architecture,\n00:09:12.000 we see with Mies' 1928 tower for Berlin,\n00:09:15.000 the question might be, "Well, where's the sun?"\n00:09:17.000 And this might have worked in Berlin, but we built it in Houston,\n00:09:20.000 and the windows are all closed. And with most products\n00:09:23.000 appearing not to have been designed for indoor use,\n00:09:25.000 this is actually a vertical gas chamber.\n00:09:28.000 When I went to Yale, we had the first energy crisis,\n00:09:31.000 and I was designing the first solar-heated house in Ireland\n00:09:33.000 as a student, which I then built --\n00:09:35.000 which would give you a sense of my ambition.\n00:09:37.000 And Richard Meier, who was one of my teachers,\n00:09:39.000 kept coming over to my desk to give me criticism,\n00:09:41.000 and he would say, "Bill, you've got to understand- --\n00:09:43.000 solar energy has nothing to do with architecture."\n00:09:51.000 I guess he didn't read Vitruvius.\n00:09:53.000 In 1984, we did the first so-called "green office" in America\n00:09:57.000 for Environmental Defense.\n00:09:58.000 We started asking manufacturers what were in their materials.\n00:10:01.000 They said, "They're proprietary, they're legal, go away."\n00:10:03.000 The only indoor quality work done in this country at that time\n00:10:05.000 was sponsored by R.J. Reynolds Tobacco Company,\n00:10:08.000 and it was to prove there was no danger\n00:10:09.000 from secondhand smoke in the workplace.\n00:10:12.000 So, all of a sudden, here I am, graduating from high school in 1969,\n00:10:16.000 and this happens, and we realize that "away" went away.\n00:10:19.000 Remember we used to throw things away, and we'd point to away?\n00:10:23.000 And yet, NOAA has now shown us, for example --\n00:10:25.000 you see that little blue thing above Hawaii?\n00:10:27.000 That's the Pacific Gyre.\n00:10:28.000 It was recently dragged for plankton by scientists,\n00:10:30.000 and they found six times as much plastic as plankton.\n00:10:34.000 When asked, they said, "It's kind of like a giant toilet that doesn't flush."\n00:10:39.000 Perhaps that's away.\n00:10:40.000 So we're looking for the design rules of this --\n00:10:42.000 this is the highest biodiversity of trees in the world, Irian Jaya,\n00:10:44.000 259 species of tree, and we described this\n00:10:48.000 in the book, "Cradle to Cradle."\n00:10:49.000 The book itself is a polymer. It is not a tree.\n00:10:53.000 That's the name of the first chapter -- "This Book is Not a Tree."\n00:10:56.000 Because in poetics, as Margaret Atwood pointed out,\n00:10:59.000 "we write our history on the skin of fish\n00:11:01.000 with the blood of bears."\n00:11:04.000 And with so much polymer, what we really need\n00:11:05.000 is technical nutrition, and to use something\n00:11:08.000 as elegant as a tree -- imagine this design assignment:\n00:11:11.000 Design something

that makes oxygen, sequesters carbon,\n00:11:13.000 fixes nitrogen, distills water, accrues solar energy as fuel,\n00:11:17.000 makes complex sugars and food, creates microclimates,\n00:11:21.000 changes colors with the seasons and self-replicates.\n00:11:27.000 Well, why don't we knock that down and write on it?\n00:11:29.000 (Laughter)\n00:11:35.000 So, we're looking at the same criteria\n00:11:37.000 as most people -- you know, can I afford it?\n00:11:39.000 Does it work? Do I like it?\n00:11:41.000 We're adding the Jeffersonian agenda, and I come from Charlottesville,\n00:11:43.000 where I've had the privilege of living in a house designed by Thomas Jefferson.\n00:11:47.000 We're adding life, liberty and the pursuit of happiness.\n00:11:53.000 Now if we look at the word "competition,"\n00:11:54.000 I'm sure most of you've used it.\n00:11:56.000 You know, most people don't realize it comes from\n00:11:57.000 the Latin competere, which means strive together.\n00:12:00.000 It means the way Olympic athletes train with each other.\n00:12:03.000 They get fit together, and then they compete.\n00:12:06.000 The Williams sisters compete -- one wins Wimbledon.\n00:12:08.000 So we've been looking at the idea of competition\n00:12:11.000 as a way of cooperating in order to get fit together.\n00:12:15.000 And the Chinese government has now --\n00:12:16.000 I work with the Chinese government now --\n00:12:18.000 has taken this up.\n00:12:20.000 We're also looking at survival of the fittest,\n00:12:22.000 not in just competition terms in our modern context\n00:12:24.000 of destroy the other or beat them to the ground,\n00:12:27.000 but really to fit together and build niches\n00:12:29.000 and have growth that is good.\n00:12:31.000 Now most environmentalists don't say growth is good,\n00:12:33.000 because, in our lexicon, asphalt is two words: assigning blame.\n00:12:38.000 But if we look at asphalt as our growth,\n00:12:41.000 then we realize that all we're doing is destroying\n00:12:43.000 the planetary's fundamental underlying operating system.\n00:12:47.000 So when we see E equals mc squared come along, from a poet's perspective,\n00:12:52.000 we see energy as physics, chemistry as mass,\n00:12:54.000 and all of a sudden, you get this biology.\n00:12:56.000 And we have plenty of energy, so we'll solve that problem,\n00:12:59.000 but the biology problem's tricky, because as we put through\n00:13:02.000 all these toxic materials that we disgorge,\n00:13:05.000 we will never be able to recover that.\n00:13:07.000 And as Francis Crick pointed out, nine years\n00:13:09.000 after discovering DNA with Mr. Watson,\n00:13:12.000 that life itself has to have growth as a precondition --\n00:13:16.000 it has to have free energy, sunlight\n00:13:18.000 and it needs to be an open system of chemicals.\n00:13:21.000 So we're asking for human artifice to become a living thing,\n00:13:24.000 and we want growth, we want free energy from sunlight\n00:13:26.000 and we want an open metabolism for chemicals.\n00:13:29.000 Then, the question becomes not growth or no growth,\n00:13:31.000 but what do you want to grow?\n00:13:34.000 So instead of just growing destruction,\n00:13:36.000 we want to grow the things that we might enjoy,\n00:13:38.000 and someday the FDA will allow us to make French cheese.\n00:13:41.000 So therefore, we have these two metabolisms,\n00:13:45.000 and I worked with a German chemist, Michael Braungart,\n00:13:47.000 and we've identified the two fundamental metabolisms.\n00:13:49.000 The biological one I'm sure you understand,\n00:13:51.000 but also the technical one, where we take materials\n00:13:53.000 and put them into closed cycles.\n00:13:55.000 We call them biological nutrition and technical nutrition.\n00:13:58.000 Technical nutrition will

be in an order of magnitude of biological nutrition.\n00:14:02.000 Biological nutrition can supply about 500 million humans,\n00:14:05.000 which means that if we all wore Birkenstocks and cotton,\n00:14:07.000 the world would run out of cork and dry up.\n00:14:10.000 So we need materials in closed cycles,\n00:14:12.000 but we need to analyze them down to the parts per million\n00:14:14.000 for cancer, birth defects, mutagenic effects,\n00:14:17.000 disruption of our immune systems, biodegradation, persistence,\n00:14:20.000 heavy metal content, knowledge of how we're making them\n00:14:23.000 and their production and so on.\n00:14:25.000 Our first product was a textile where we analyzed 8,000 chemicals\n00:14:29.000 in the textile industry.\n00:14:30.000 Using those intellectual filters, we eliminated [7,962.]\n00:14:35.000 We were left with 38 chemicals.\n00:14:37.000 We have since databased the 4000 most commonly used chemicals\n00:14:40.000 in human manufacturing, and we're releasing this database into the public in six weeks.\n00:14:45.000 So designers all over the world can analyze their products\n00:14:47.000 down to the parts per million for human and ecological health.\n00:14:52.000 (Applause)\n00:14:57.000 We've developed a protocol so that companies can send\n00:15:00.000 these same messages all the way through their supply chains,\n00:15:03.000 because when we asked most companies we work with -- about a trillion dollars\n00:15:06.000 -- and say, "Where does your stuff come from?" They say, "Suppliers."\n00:15:08.000 "And where does it go?"\n00:15:10.000 "Customers."\n00:15:11.000 So we need some help there.\n00:15:12.000 So the biological nutrients, the first fabrics --\n00:15:14.000 the water coming out was clean enough to drink.\n00:15:16.000 Technical nutrients -- this is for Shaw Carpet, infinitely reusable carpet.\n00:15:20.000 Here's nylon going back to caprolactam back to carpet.\n00:15:23.000 Biotechnical nutrients -- the Model U for Ford Motor,\n00:15:26.000 a cradle to cradle car -- concept car.\n00:15:28.000 Shoes for Nike, where the uppers are polyesters, infinitely recyclable,\n00:15:32.000 the bottoms are biodegradable soles.\n00:15:35.000 Wear your old shoes in, your new shoes out.\n00:15:37.000 There is no finish line.\n00:15:39.000 The idea here of the car is that some of the materials\n00:15:41.000 go back to the industry forever, some of the materials go back to soil --\n00:15:44.000 it's all solar-powered.\n00:15:46.000 Here's a building at Oberlin College we designed\n00:15:48.000 that makes more energy than it needs to operate and purifies its own water.\n00:15:52.000 Here's a building for The Gap, where the ancient grasses\n00:15:54.000 of San Bruno, California, are on the roof.\n00:15:58.000 And this is our project for Ford Motor Company.\n00:16:00.000 It's the revitalization of the River Rouge in Dearborn.\n00:16:02.000 This is obviously a color photograph.\n00:16:06.000 These are our tools. These are how we sold it to Ford.\n00:16:10.000 We saved Ford 35 million dollars doing it this way, day one,\n00:16:13.000 which is the equivalent of the Ford Taurus\n00:16:15.000 at a four percent margin of an order for 900 million dollars worth of cars.\n00:16:19.000 Here it is. It's the world's largest green roof, 10 and a half acres.\n00:16:22.000 This is the roof, saving money,\n00:16:25.000 and this is the first species to arrive here. These are killdeer.\n00:16:29.000 They showed up in five days.\n00:16:32.000 And we now have 350-pound auto workers\n00:16:34.000 learning bird songs on the Internet.\n00:16:38.000 We're developing now protocols for cities --\n00:16:40.000 that's the home of technical nutrients.\n00:16:42.000 The country -- the home of biological. And putting them together.\n00:16:45.000 And so I will finish by showing you a new city\n00:16:47.000 we're designing for the Chinese

government.\n00:16:49.000 We're doing 12 cities for China right now,\n00:16:52.000 based on cradle to cradle as templates.\n00:16:54.000 Our assignment is to develop protocols for the housing\n00:16:57.000 for 400 million people in 12 years.\n00:16:59.000 We did a mass energy balance -- if they use brick,\n00:17:01.000 they will lose all their soil and burn all their coal.\n00:17:04.000 They'll have cities with no energy and no food.\n00:17:06.000 We signed a Memorandum of Understanding --\n00:17:08.000 here's Madam Deng Nan, Deng Xiaoping's daughter --\n00:17:10.000 for China to adopt cradle to cradle.\n00:17:12.000 Because if they toxify themselves, being the lowest-cost producer,\n00:17:16.000 send it to the lowest-cost distribution -- Wal-Mart -- \n00:17:18.000 and then we send them all our money, what we'll discover is that\n00:17:21.000 we have what, effectively, when I was a student,\n00:17:24.000 was called mutually assured destruction.\n00:17:27.000 Now we do it by molecule. These are our cities.\n00:17:30.000 We're building a new city next to this city; look at that landscape.\n00:17:33.000 This is the site.\n00:17:35.000 We don't normally do green fields, but this one is about to be built,\n00:17:39.000 so they brought us in to intercede.\n00:17:41.000 This is their plan.\n00:17:43.000 It's a rubber stamp grid that they laid right on that landscape.\n00:17:46.000 And they brought us in and said, "What would you do?"\n00:17:49.000 This is what they would end up with, which is another color photograph.\n00:17:53.000 So this is the existing site, so this is what it looks like now,\n00:17:56.000 and here's our proposal.\n00:17:58.000 (Applause)\n00:18:02.000 So the way we approached this\n00:18:04.000 is we studied the hydrology very carefully.\n00:18:06.000 We studied the biota, the ancient biota,\n00:18:08.000 the current farming and the protocols.\n00:18:10.000 We studied the winds and the sun to make sure everybody in the city\n00:18:12.000 will have fresh air, fresh water and direct sunlight\n00:18:18.000 in every single apartment at some point during the day.\n00:18:21.000 We then take the parks and lay them out as ecological infrastructure.\n00:18:25.000 We lay out the building areas.\n00:18:28.000 We start to integrate commercial and mixed use\n00:18:29.000 so the people all have centers and places to be.\n00:18:32.000 The transportation is all very simple,\n00:18:34.000 everybody's within a five-minute walk of mobility.\n00:18:37.000 We have a 24-hour street, so that there's always a place that's alive.\n00:18:42.000 The waste systems all connect.\n00:18:44.000 If you flush a toilet, your feces will go to the sewage treatment plants,\n00:18:49.000 which are sold as assets, not liabilities.\n00:18:51.000 Because who wants the fertilizer factory that makes natural gas?\n00:18:55.000 The waters are all taken in to construct the wetlands for habitat restorations.\n00:19:00.000 And then it makes natural gas, which then goes back into the city\n00:19:04.000 to power the fuel for the cooking for the city.\n00:19:08.000 So this is -- these are fertilizer gas plants.\n00:19:10.000 And then the compost is all taken back\n00:19:13.000 to the roofs of the city, where we've got farming,\n00:19:15.000 because what we've done is lifted up the city,\n00:19:19.000 the landscape, into the air to -- to restore the native landscape\n00:19:26.000 on the roofs of the buildings.\n00:19:28.000 The solar power of all the factory centers\n00:19:31.000 and all the industrial zones with their light roofs powers the city.\n00:19:34.000 And this is the concept for the top of the city.\n00:19:36.000 We've lifted the earth up onto the roofs.\n00:19:40.000 The farmers have little bridges to get from one roof to the next.\n00:19:44.000 We inhabit the city with work/live space on all the ground floors.\n00:19:48.000 And so this is

the existing city, and this is the new city.\n00:19:53.000 (Applause)\n\nThe file is too long and its contents have been truncated.\n", "extra": {"cited_message_idx": 12, "search_result_idx": null, "evidence_text": "source"}}}, {"start_ix": 1012, "end_ix": 1023, "citation_format_type": "tether_og", "metadata": {"type": "file", "name": "tactiq-free-transcript-IoRjz8iTVoo.txt", "id": "file-QAdtwx5q5xmFsPgGvYJdRiuF", "source": "my_files", "text": "# tactiq.io free youtube transcript\n# Cradle to cradle design | William McDonough\n# https://www.youtube.com/watch/IoRjz8iTVoo\n\n00:00:26.000 In 1962, with Rachel Carson's "Silent Spring,"\n00:00:30.000 I think for people like me in the world of the making of things,\n00:00:35.000 the canary in the mine wasn't singing.\n00:00:39.000 And so the question that we might not have birds\n00:00:42.000 became kind of fundamental to those of us wandering around\n00:00:45.000 looking for the meadowlarks that seemed to have all disappeared.\n00:00:48.000 And the question was, were the birds singing?\n00:00:51.000 Now, I'm not a scientist, that'll be really clear.\n00:00:55.000 But, you know, we've just come from this discussion of what a bird might be.\n00:00:59.000 What is a bird?\n00:01:00.000 Well, in my world, this is a rubber duck.\n00:01:04.000 It comes in California with a warning --\n00:01:06.000 "This product contains chemicals known by the State of California\n00:01:09.000 to cause cancer and birth defects or other reproductive harm."\n00:01:16.000 This is a bird.\n00:01:19.000 What kind of culture would produce a product of this kind\n00:01:22.000 and then label it and sell it to children?\n00:01:27.000 I think we have a design problem.\n00:01:30.000 Someone heard the six hours of talk that I gave\n00:01:35.000 called "The Monticello Dialogues" on NPR, and sent me this as a thank you note --\n00:01:41.000 "We realize that design is a signal of intention,\n00:01:43.000 but it also has to occur within a world,\n00:01:46.000 and we have to understand that world in order to\n00:01:50.000 imbue our designs with inherent intelligence,\n00:01:53.000 and so as we look back at the basic state of affairs\n00:01:58.000 in which we design, we, in a way, need to go to the primordial condition\n00:02:03.000 to understand the operating system and the frame conditions of a planet,\n00:02:08.000 and I think the exciting part of that is the good news that's there,\n00:02:13.000 because the news is the news of abundance,\n00:02:16.000 and not the news of limits,\n00:02:18.000 and I think as our culture tortures itself now\n00:02:23.000 with tyrannies and concerns over limits and fear,\n00:02:28.000 we can add this other dimension of abundance that is coherent,\n00:02:33.000 driven by the sun, and start to imagine\n00:02:35.000 what that would be like to share."\n00:02:42.000 That was a nice thing to get.\n00:02:44.000 That was one sentence.\n00:02:48.000 Henry James would be proud.\n00:02:50.000 This is -- I put it down at the bottom,\n00:02:52.000 but that was extemporaneous, obviously.\n00:02:55.000 The fundamental issue is that, for me,\n00:02:58.000 design is the first signal of human intentions.\n00:03:00.000 So what are our intentions, and what would our intentions be --\n00:03:04.000 if we wake up in the morning, we have designs on the world --\n00:03:07.000 well, what would our intention be as a species\n00:03:09.000 now that we're the dominant species?\n00:03:11.000 And it's not just stewardship and dominion debate,\n00:03:14.000 because really, dominion is implicit in stewardship --\n00:03:20.000 because how could you dominate something you had killed?\n00:03:22.000 And stewardship's implicit in dominion,\n00:03:24.000 because you can't be steward of something if you can't dominate it.\n00:03:26.000 So the question is, what is the first question for designers?\n00:03:32.000 Now, as guardians --

let's say the state, for example,\n00:03:35.000 which reserves the right to kill, the right to be duplicitous and so on --\n00:03:40.000 the question we're asking the guardian at this point is\n00:03:43.000 are we meant, how are we meant,\n00:03:45.000 to secure local societies, create world peace\n00:03:47.000 and save the environment?\n00:03:49.000 But I don't know that that's the common debate.\n00:03:52.000 Commerce, on the other hand, is relatively quick,\n00:03:56.000 essentially creative, highly effective and efficient,\n00:03:58.000 and fundamentally honest, because we can't exchange\n00:04:01.000 value for very long if we don't trust each other.\n00:04:05.000 So we use the tools of commerce primarily for our work,\n00:04:07.000 but the question we bring to it is,\n00:04:09.000 how do we love all the children of all species for all time?\n00:04:13.000 And so we start our designs with that question.\n00:04:16.000 Because what we realize today is that modern culture\n00:04:18.000 appears to have adopted a strategy of tragedy.\n00:04:21.000 If we come here and say, "Well, I didn't intend\n00:04:23.000 to cause global warming on the way here,"\n00:04:24.000 and we say, "That's not part of my plan,"\n00:04:26.000 then we realize it's part of our de facto plan.\n00:04:29.000 Because it's the thing that's happening because we have no other plan.\n00:04:32.000 And I was at the White House for President Bush,\n00:04:34.000 meeting with every federal department and agency,\n00:04:36.000 and I pointed out that they appear to have no plan.\n00:04:40.000 If the end game is global warming, they're doing great.\n00:04:42.000 If the end game is mercury toxification of our children\n00:04:45.000 downwind of coal fire plants as they scuttled the Clean Air Act,\n00:04:48.000 then I see that our education programs should be explicitly defined as,\n00:04:52.000 "Brain death for all children. No child left behind."\n00:04:54.000 (Applause)\n00:04:58.000 So, the question is, how many federal officials\n00:05:02.000 are ready to move to Ohio and Pennsylvania with their families?\n00:05:05.000 So if you don't have an endgame of something delightful,\n00:05:09.000 then you're just moving chess pieces around,\n00:05:11.000 if you don't know you're taking the king.\n00:05:12.000 So perhaps we could develop a strategy of change,\n00:05:15.000 which requires humility. And in my business as an architect,\n00:05:18.000 it's unfortunate the word "humility" and the word "architect"\n00:05:22.000 have not appeared in the same paragraph since "The Fountainhead."\n00:05:25.000 So if anybody here has trouble with the concept of design humility,\n00:05:30.000 reflect on this -- it took us 5,000 years\n00:05:33.000 to put wheels on our luggage.\n00:05:37.000 So, as Kevin Kelly pointed out, there is no endgame.\n00:05:42.000 There is an infinite game, and we're playing in that infinite game.\n00:05:46.000 And so we call it "cradle to cradle,"\n00:05:48.000 and our goal is very simple.\n00:05:49.000 This is what I presented to the White House.\n00:05:51.000 Our goal is a delightfully diverse, safe, healthy and just world,\n00:05:54.000 with clean air, clean water, soil and power --\n00:05:57.000 economically, equitably, ecologically and elegantly enjoyed, period.\n00:06:01.000 (Applause)\n00:06:04.000 What don't you like about this?\n00:06:07.000 Which part of this don't you like?\n00:06:09.000 So we realized we want full diversity,\n00:06:11.000 even though it can be difficult to remember what De Gaulle said\n00:06:14.000 when asked what it was like to be President of France.\n00:06:16.000 He said, "What do you think it's like trying to run a country with 400 kinds of cheese?"\n00:06:20.000 But at the same time, we

realize that our products are not safe and healthy.\n00:06:23.000 So we've designed products\n00:06:25.000 and we analyzed chemicals down to the parts per million.\n00:06:27.000 This is a baby blanket by Pendleton that will give your child nutrition\n00:06:30.000 instead of Alzheimer's later in life.\n00:06:32.000 We can ask ourselves, what is justice,\n00:06:34.000 and is justice blind, or is justice blindness?\n00:06:38.000 And at what point did that uniform turn from white to black?\n00:06:43.000 Water has been declared a human right by the United Nations.\n00:06:46.000 Air quality is an obvious thing to anyone who breathes.\n00:06:48.000 Is there anybody here who doesn't breathe?\n00:06:51.000 Clean soil is a critical problem -- the nitrification, the dead zones\n00:06:54.000 in the Gulf of Mexico.\n00:06:56.000 A fundamental issue that's not being addressed.\n00:06:58.000 We've seen the first form of solar energy\n00:07:00.000 that's beat the hegemony of fossil fuels in the form of wind\n00:07:03.000 here in the Great Plains, and so that hegemony is leaving.\n00:07:06.000 And if we remember Sheikh Yamani when he formed OPEC,\n00:07:09.000 they asked him, "When will we see the end of the age of oil?"\n00:07:12.000 I don't know if you remember his answer, but it was,\n00:07:15.000 "The Stone Age didn't end because we ran out of stones."\n00:07:19.000 We see that companies acting ethically in this world\n00:07:23.000 are outperforming those that don't.\n00:07:24.000 We see the flows of materials in a rather terrifying prospect.\n00:07:29.000 This is a hospital monitor from Los Angeles, sent to China.\n00:07:32.000 This woman will expose herself to toxic phosphorous,\n00:07:35.000 release four pounds of toxic lead into her childrens' environment,\n00:07:38.000 which is from copper.\n00:07:40.000 On the other hand, we see great signs of hope.\n00:07:42.000 Here's Dr. Venkataswamy in India, who's figured out\n00:07:45.000 how to do mass-produced health.\n00:07:47.000 He has given eyesight to two million people for free.\n00:07:51.000 We see in our material flows that car steels don't become car steel again\n00:07:54.000 because of the contaminants of the coatings --\n00:07:56.000 bismuth, antimony, copper and so on.\n00:07:58.000 They become building steel.\n00:07:59.000 On the other hand, we're working with Berkshire Hathaway,\n00:08:01.000 Warren Buffett and Shaw Carpet,\n00:08:04.000 the largest carpet company in the world.\n00:08:05.000 We've developed a carpet that is continuously recyclable,\n00:08:08.000 down to the parts per million.\n00:08:11.000 The upper is Nylon 6 that can go back to caprolactam,\n00:08:14.000 the bottom, a polyolephine -- infinitely recyclable thermoplastic.\n00:08:17.000 Now if I was a bird, the building on my left is a liability.\n00:08:21.000 The building on my right, which is our corporate campus for The Gap\n00:08:24.000 with an ancient meadow, is an asset -- its nesting grounds.\n00:08:29.000 Here's where I come from. I grew up in Hong Kong,\n00:08:31.000 with six million people in 40 square miles.\n00:08:33.000 During the dry season, we had four hours of water every fourth day.\n00:08:37.000 And the relationship to landscape was that of farmers who have been\n00:08:40.000 farming the same piece of ground for 40 centuries.\n00:08:44.000 You can't farm the same piece of ground for 40 centuries\n00:08:46.000 without understanding nutrient flow.\n00:08:49.000 My childhood summers were in the Puget Sound of Washington,\n00:08:52.000 among the first growth and big growth.\n00:08:54.000 My grandfather had been a lumberjack in the Olympics,\n00:08:56.000 so I have a lot of tree karma I am working off.\n00:09:01.000 I went to Yale for graduate school,\n00:09:03.000 studied in a building of this style by Le Corbusier,\n00:09:05.000 affectionately known in our business as

Brutalism.\n00:09:09.000 If we look at the world of architecture,\n00:09:12.000 we see with Mies' 1928 tower for Berlin,\n00:09:15.000 the question might be, "Well, where's the sun?"\n00:09:17.000 And this might have worked in Berlin, but we built it in Houston,\n00:09:20.000 and the windows are all closed. And with most products\n00:09:23.000 appearing not to have been designed for indoor use,\n00:09:25.000 this is actually a vertical gas chamber.\n00:09:28.000 When I went to Yale, we had the first energy crisis,\n00:09:31.000 and I was designing the first solar-heated house in Ireland\n00:09:33.000 as a student, which I then built --\n00:09:35.000 which would give you a sense of my ambition.\n00:09:37.000 And Richard Meier, who was one of my teachers,\n00:09:39.000 kept coming over to my desk to give me criticism,\n00:09:41.000 and he would say, "Bill, you've got to understand- --\n00:09:43.000 solar energy has nothing to do with architecture."\n00:09:51.000 I guess he didn't read Vitruvius.\n00:09:53.000 In 1984, we did the first so-called "green office" in America\n00:09:57.000 for Environmental Defense.\n00:09:58.000 We started asking manufacturers what were in their materials.\n00:10:01.000 They said, "They're proprietary, they're legal, go away."\n00:10:03.000 The only indoor quality work done in this country at that time\n00:10:05.000 was sponsored by R.J. Reynolds Tobacco Company,\n00:10:08.000 and it was to prove there was no danger\n00:10:09.000 from secondhand smoke in the workplace.\n00:10:12.000 So, all of a sudden, here I am, graduating from high school in 1969,\n00:10:16.000 and this happens, and we realize that "away" went away.\n00:10:19.000 Remember we used to throw things away, and we'd point to away?\n00:10:23.000 And yet, NOAA has now shown us, for example --\n00:10:25.000 you see that little blue thing above Hawaii?\n00:10:27.000 That's the Pacific Gyre.\n00:10:28.000 It was recently dragged for plankton by scientists,\n00:10:30.000 and they found six times as much plastic as plankton.\n00:10:34.000 When asked, they said, "It's kind of like a giant toilet that doesn't flush."\n00:10:39.000 Perhaps that's away.\n00:10:40.000 So we're looking for the design rules of this --\n00:10:42.000 this is the highest biodiversity of trees in the world, Irian Jaya,\n00:10:44.000 259 species of tree, and we described this\n00:10:48.000 in the book, "Cradle to Cradle."\n00:10:49.000 The book itself is a polymer. It is not a tree.\n00:10:53.000 That's the name of the first chapter -- "This Book is Not a Tree."\n00:10:56.000 Because in poetics, as Margaret Atwood pointed out,\n00:10:59.000 "we write our history on the skin of fish\n00:11:01.000 with the blood of bears."\n00:11:04.000 And with so much polymer, what we really need\n00:11:05.000 is technical nutrition, and to use something\n00:11:08.000 as elegant as a tree -- imagine this design assignment:\n00:11:11.000 Design something that makes oxygen, sequesters carbon,\n00:11:13.000 fixes nitrogen, distills water, accrues solar energy as fuel,\n00:11:17.000 makes complex sugars and food, creates microclimates,\n00:11:21.000 changes colors with the seasons and self-replicates.\n00:11:27.000 Well, why don't we knock that down and write on it?\n00:11:29.000 (Laughter)\n00:11:35.000 So, we're looking at the same criteria\n00:11:37.000 as most people -- you know, can I afford it?\n00:11:39.000 Does it work? Do I like it?\n00:11:41.000 We're adding the Jeffersonian agenda, and I come from Charlottesville,\n00:11:43.000 where I've had the privilege of living in a house designed by Thomas Jefferson.\n00:11:47.000 We're adding life, liberty and the pursuit of happiness.\n00:11:53.000 Now if we look at the word "competition,"\n00:11:54.000 I'm sure most of you've used

it.\n00:11:56.000 You know, most people don't realize it comes from\n00:11:57.000 the Latin competere, which means strive together.\n00:12:00.000 It means the way Olympic athletes train with each other.\n00:12:03.000 They get fit together, and then they compete.\n00:12:06.000 The Williams sisters compete -- one wins Wimbledon.\n00:12:08.000 So we've been looking at the idea of competition\n00:12:11.000 as a way of cooperating in order to get fit together.\n00:12:15.000 And the Chinese government has now --\n00:12:16.000 I work with the Chinese government now --\n00:12:18.000 has taken this up.\n00:12:20.000 We're also looking at survival of the fittest,\n00:12:22.000 not in just competition terms in our modern context\n00:12:24.000 of destroy the other or beat them to the ground,\n00:12:27.000 but really to fit together and build niches\n00:12:29.000 and have growth that is good.\n00:12:31.000 Now most environmentalists don't say growth is good,\n00:12:33.000 because, in our lexicon, asphalt is two words: assigning blame.\n00:12:38.000 But if we look at asphalt as our growth,\n00:12:41.000 then we realize that all we're doing is destroying\n00:12:43.000 the planetary's fundamental underlying operating system.\n00:12:47.000 So when we see E equals mc squared come along, from a poet's perspective,\n00:12:52.000 we see energy as physics, chemistry as mass,\n00:12:54.000 and all of a sudden, you get this biology.\n00:12:56.000 And we have plenty of energy, so we'll solve that problem,\n00:12:59.000 but the biology problem's tricky, because as we put through\n00:13:02.000 all these toxic materials that we disgorge,\n00:13:05.000 we will never be able to recover that.\n00:13:07.000 And as Francis Crick pointed out, nine years\n00:13:09.000 after discovering DNA with Mr. Watson,\n00:13:12.000 that life itself has to have growth as a precondition --\n00:13:16.000 it has to have free energy, sunlight\n00:13:18.000 and it needs to be an open system of chemicals.\n00:13:21.000 So we're asking for human artifice to become a living thing,\n00:13:24.000 and we want growth, we want free energy from sunlight\n00:13:26.000 and we want an open metabolism for chemicals.\n00:13:29.000 Then, the question becomes not growth or no growth,\n00:13:31.000 but what do you want to grow?\n00:13:34.000 So instead of just growing destruction,\n00:13:36.000 we want to grow the things that we might enjoy,\n00:13:38.000 and someday the FDA will allow us to make French cheese.\n00:13:41.000 So therefore, we have these two metabolisms,\n00:13:45.000 and I worked with a German chemist, Michael Braungart,\n00:13:47.000 and we've identified the two fundamental metabolisms.\n00:13:49.000 The biological one I'm sure you understand,\n00:13:51.000 but also the technical one, where we take materials\n00:13:53.000 and put them into closed cycles.\n00:13:55.000 We call them biological nutrition and technical nutrition.\n00:13:58.000 Technical nutrition will be in an order of magnitude of biological nutrition.\n00:14:02.000 Biological nutrition can supply about 500 million humans,\n00:14:05.000 which means that if we all wore Birkenstocks and cotton,\n00:14:07.000 the world would run out of cork and dry up.\n00:14:10.000 So we need materials in closed cycles,\n00:14:12.000 but we need to analyze them down to the parts per million\n00:14:14.000 for cancer, birth defects, mutagenic effects,\n00:14:17.000 disruption of our immune systems, biodegradation, persistence,\n00:14:20.000 heavy metal content, knowledge of how we're making them\n00:14:23.000 and their production and so on.\n00:14:25.000 Our first product was a textile where we analyzed 8,000 chemicals\n00:14:29.000 in the textile industry.\n00:14:30.000 Using those intellectual filters, we eliminated [7,962.]\n00:14:35.000 We were left with 38 chemicals.\n00:14:37.000 We have since

databased the 4000 most commonly used chemicals\n00:14:40.000 in human manufacturing, and we're releasing this database into the public in six weeks.\n00:14:45.000 So designers all over the world can analyze their products\n00:14:47.000 down to the parts per million for human and ecological health.\n00:14:52.000 (Applause)\n00:14:57.000 We've developed a protocol so that companies can send\n00:15:00.000 these same messages all the way through their supply chains,\n00:15:03.000 because when we asked most companies we work with -- about a trillion dollars\n00:15:06.000 -- and say, "Where does your stuff come from?" They say, "Suppliers."\n00:15:08.000 "And where does it go?"\n00:15:10.000 "Customers."\n00:15:11.000 So we need some help there.\n00:15:12.000 So the biological nutrients, the first fabrics --\n00:15:14.000 the water coming out was clean enough to drink.\n00:15:16.000 Technical nutrients -- this is for Shaw Carpet, infinitely reusable carpet.\n00:15:20.000 Here's nylon going back to caprolactam back to carpet.\n00:15:23.000 Biotechnical nutrients -- the Model U for Ford Motor,\n00:15:26.000 a cradle to cradle car -- concept car.\n00:15:28.000 Shoes for Nike, where the uppers are polyesters, infinitely recyclable,\n00:15:32.000 the bottoms are biodegradable soles.\n00:15:35.000 Wear your old shoes in, your new shoes out.\n00:15:37.000 There is no finish line.\n00:15:39.000 The idea here of the car is that some of the materials\n00:15:41.000 go back to the industry forever, some of the materials go back to soil --\n00:15:44.000 it's all solar-powered.\n00:15:46.000 Here's a building at Oberlin College we designed\n00:15:48.000 that makes more energy than it needs to operate and purifies its own water.\n00:15:52.000 Here's a building for The Gap, where the ancient grasses\n00:15:54.000 of San Bruno, California, are on the roof.\n00:15:58.000 And this is our project for Ford Motor Company.\n00:16:00.000 It's the revitalization of the River Rouge in Dearborn.\n00:16:02.000 This is obviously a color photograph.\n00:16:06.000 These are our tools. These are how we sold it to Ford.\n00:16:10.000 We saved Ford 35 million dollars doing it this way, day one,\n00:16:13.000 which is the equivalent of the Ford Taurus\n00:16:15.000 at a four percent margin of an order for 900 million dollars worth of cars.\n00:16:19.000 Here it is. It's the world's largest green roof, 10 and a half acres.\n00:16:22.000 This is the roof, saving money,\n00:16:25.000 and this is the first species to arrive here. These are killdeer.\n00:16:29.000 They showed up in five days.\n00:16:32.000 And we now have 350-pound auto workers\n00:16:34.000 learning bird songs on the Internet.\n00:16:38.000 We're developing now protocols for cities --\n00:16:40.000 that's the home of technical nutrients.\n00:16:42.000 The country -- the home of biological. And putting them together.\n00:16:45.000 And so I will finish by showing you a new city\n00:16:47.000 we're designing for the Chinese government.\n00:16:49.000 We're doing 12 cities for China right now,\n00:16:52.000 based on cradle to cradle as templates.\n00:16:54.000 Our assignment is to develop protocols for the housing\n00:16:57.000 for 400 million people in 12 years.\n00:16:59.000 We did a mass energy balance -- if they use brick,\n00:17:01.000 they will lose all their soil and burn all their coal.\n00:17:04.000 They'll have cities with no energy and no food.\n00:17:06.000 We signed a Memorandum of Understanding --\n00:17:08.000 here's Madam Deng Nan, Deng Xiaoping's daughter --\n00:17:10.000 for China to adopt cradle to cradle.\n00:17:12.000 Because if they toxify themselves, being the lowest-cost producer,\n00:17:16.000 send it to the lowest-cost distribution -- Wal-Mart --\n00:17:18.000 and then we send them all our money, what we'll discover is

that\n00:17:21.000 we have what, effectively, when I was a student,\n00:17:24.000 was called mutually assured destruction.\n00:17:27.000 Now we do it by molecule. These are our cities.\n00:17:30.000 We're building a new city next to this city; look at that landscape.\n00:17:33.000 This is the site.\n00:17:35.000 We don't normally do green fields, but this one is about to be built,\n00:17:39.000 so they brought us in to intercede.\n00:17:41.000 This is their plan.\n00:17:43.000 It's a rubber stamp grid that they laid right on that landscape.\n00:17:46.000 And they brought us in and said, "What would you do?"\n00:17:49.000 This is what they would end up with, which is another color photograph.\n00:17:53.000 So this is the existing site, so this is what it looks like now,\n00:17:56.000 and here's our proposal.\n00:17:58.000 (Applause)\n00:18:02.000 So the way we approached this\n00:18:04.000 is we studied the hydrology very carefully.\n00:18:06.000 We studied the biota, the ancient biota,\n00:18:08.000 the current farming and the protocols.\n00:18:10.000 We studied the winds and the sun to make sure everybody in the city\n00:18:12.000 will have fresh air, fresh water and direct sunlight\n00:18:18.000 in every single apartment at some point during the day.\n00:18:21.000 We then take the parks and lay them out as ecological infrastructure.\n00:18:25.000 We lay out the building areas.\n00:18:28.000 We start to integrate commercial and mixed use\n00:18:29.000 so the people all have centers and places to be.\n00:18:32.000 The transportation is all very simple,\n00:18:34.000 everybody's within a five-minute walk of mobility.\n00:18:37.000 We have a 24-hour street, so that there's always a place that's alive.\n00:18:42.000 The waste systems all connect.\n00:18:44.000 If you flush a toilet, your feces will go to the sewage treatment plants,\n00:18:49.000 which are sold as assets, not liabilities.\n00:18:51.000 Because who wants the fertilizer factory that makes natural gas?\n00:18:55.000 The waters are all taken in to construct the wetlands for habitat restorations.\n00:19:00.000 And then it makes natural gas, which then goes back into the city\n00:19:04.000 to power the fuel for the cooking for the city.\n00:19:08.000 So this is -- these are fertilizer gas plants.\n00:19:10.000 And then the compost is all taken back\n00:19:13.000 to the roofs of the city, where we've got farming,\n00:19:15.000 because what we've done is lifted up the city,\n00:19:19.000 the landscape, into the air to -- to restore the native landscape\n00:19:26.000 on the roofs of the buildings.\n00:19:28.000 The solar power of all the factory centers\n00:19:31.000 and all the industrial zones with their light roofs powers the city.\n00:19:34.000 And this is the concept for the top of the city.\n00:19:36.000 We've lifted the earth up onto the roofs.\n00:19:40.000 The farmers have little bridges to get from one roof to the next.\n00:19:44.000 We inhabit the city with work/live space on all the ground floors.\n00:19:48.000 And so this is the existing city, and this is the new city.\n00:19:53.000 (Applause)\n\nThe file is too long and its contents have been truncated.\n", "extra": {"cited_message_idx": 12, "search_result_idx": null, "evidence_text": "source"}}}, {"start_ix": 1468, "end_ix": 1479, "citation_format_type": "tether_og", "metadata": {"type": "file", "name": "tactiq-free-transcript-IoRjz8iTVoo.txt", "id": "file-QAdtwx5q5xmFsPgGvYJdRiuF", "source": "my_files", "text": "# tactiq.io free youtube transcript\n# Cradle to cradle design | William McDonough\n# https://www.youtube.com/watch/IoRjz8iTVoo\n\n00:00:26.000 In 1962, with Rachel Carson's "Silent Spring,"\n00:00:30.000 I think for people like me in the world of the making of things,\n00:00:35.000 the canary in the mine wasn't singing.\n00:00:39.000 And so the question that we might not have birds\n00:00:42.000

became kind of fundamental to those of us wandering around\n00:00:45.000 looking for the meadowlarks that seemed to have all disappeared.\n00:00:48.000 And the question was, were the birds singing?\n00:00:51.000 Now, I'm not a scientist, that'll be really clear.\n00:00:55.000 But, you know, we've just come from this discussion of what a bird might be.\n00:00:59.000 What is a bird?\n00:01:00.000 Well, in my world, this is a rubber duck.\n00:01:04.000 It comes in California with a warning --\n00:01:06.000 "This product contains chemicals known by the State of California\n00:01:09.000 to cause cancer and birth defects or other reproductive harm."\n00:01:16.000 This is a bird.\n00:01:19.000 What kind of culture would produce a product of this kind\n00:01:22.000 and then label it and sell it to children?\n00:01:27.000 I think we have a design problem.\n00:01:30.000 Someone heard the six hours of talk that I gave\n00:01:35.000 called "The Monticello Dialogues" on NPR, and sent me this as a thank you note --\n00:01:41.000 "We realize that design is a signal of intention,\n00:01:43.000 but it also has to occur within a world,\n00:01:46.000 and we have to understand that world in order to\n00:01:50.000 imbue our designs with inherent intelligence,\n00:01:53.000 and so as we look back at the basic state of affairs\n00:01:58.000 in which we design, we, in a way, need to go to the primordial condition\n00:02:03.000 to understand the operating system and the frame conditions of a planet,\n00:02:08.000 and I think the exciting part of that is the good news that's there,\n00:02:13.000 because the news is the news of abundance,\n00:02:16.000 and not the news of limits,\n00:02:18.000 and I think as our culture tortures itself now\n00:02:23.000 with tyrannies and concerns over limits and fear,\n00:02:28.000 we can add this other dimension of abundance that is coherent,\n00:02:33.000 driven by the sun, and start to imagine\n00:02:35.000 what that would be like to share."\n00:02:42.000 That was a nice thing to get.\n00:02:44.000 That was one sentence.\n00:02:48.000 Henry James would be proud.\n00:02:50.000 This is -- I put it down at the bottom,\n00:02:52.000 but that was extemporaneous, obviously.\n00:02:55.000 The fundamental issue is that, for me,\n00:02:58.000 design is the first signal of human intentions.\n00:03:00.000 So what are our intentions, and what would our intentions be --\n00:03:04.000 if we wake up in the morning, we have designs on the world --\n00:03:07.000 well, what would our intention be as a species\n00:03:09.000 now that we're the dominant species?\n00:03:11.000 And it's not just stewardship and dominion debate,\n00:03:14.000 because really, dominion is implicit in stewardship --\n00:03:20.000 because how could you dominate something you had killed?\n00:03:22.000 And stewardship's implicit in dominion,\n00:03:24.000 because you can't be steward of something if you can't dominate it.\n00:03:26.000 So the question is, what is the first question for designers?\n00:03:32.000 Now, as guardians -- let's say the state, for example,\n00:03:35.000 which reserves the right to kill, the right to be duplicitous and so on --\n00:03:40.000 the question we're asking the guardian at this point is\n00:03:43.000 are we meant, how are we meant,\n00:03:45.000 to secure local societies, create world peace\n00:03:47.000 and save the environment?\n00:03:49.000 But I don't know that that's the common debate.\n00:03:52.000 Commerce, on the other hand, is relatively quick,\n00:03:56.000 essentially creative, highly effective and efficient,\n00:03:58.000 and fundamentally honest, because we can't exchange\n00:04:01.000 value for very long if we don't trust each other.\n00:04:05.000 So we use the tools of commerce primarily for our work,\n00:04:07.000 but the question we bring to it is,\n00:04:09.000 how do we love all the children of all species for all time?\n00:04:13.000 And so we start

our designs with that question.\n00:04:16.000 Because what we realize today is that modern culture\n00:04:18.000 appears to have adopted a strategy of tragedy.\n00:04:21.000 If we come here and say, "Well, I didn't intend\n00:04:23.000 to cause global warming on the way here,"\n00:04:24.000 and we say, "That's not part of my plan,"\n00:04:26.000 then we realize it's part of our de facto plan.\n00:04:29.000 Because it's the thing that's happening because we have no other plan.\n00:04:32.000 And I was at the White House for President Bush,\n00:04:34.000 meeting with every federal department and agency,\n00:04:36.000 and I pointed out that they appear to have no plan.\n00:04:40.000 If the end game is global warming, they're doing great.\n00:04:42.000 If the end game is mercury toxification of our children\n00:04:45.000 downwind of coal fire plants as they scuttled the Clean Air Act,\n00:04:48.000 then I see that our education programs should be explicitly defined as,\n00:04:52.000 "Brain death for all children. No child left behind."\n00:04:54.000 (Applause)\n00:04:58.000 So, the question is, how many federal officials\n00:05:02.000 are ready to move to Ohio and Pennsylvania with their families?\n00:05:05.000 So if you don't have an endgame of something delightful,\n00:05:09.000 then you're just moving chess pieces around,\n00:05:11.000 if you don't know you're taking the king.\n00:05:12.000 So perhaps we could develop a strategy of change,\n00:05:15.000 which requires humility. And in my business as an architect,\n00:05:18.000 it's unfortunate the word "humility" and the word "architect"\n00:05:22.000 have not appeared in the same paragraph since "The Fountainhead."\n00:05:25.000 So if anybody here has trouble with the concept of design humility,\n00:05:30.000 reflect on this -- it took us 5,000 years\n00:05:33.000 to put wheels on our luggage.\n00:05:37.000 So, as Kevin Kelly pointed out, there is no endgame.\n00:05:42.000 There is an infinite game, and we're playing in that infinite game.\n00:05:46.000 And so we call it "cradle to cradle,"\n00:05:48.000 and our goal is very simple.\n00:05:49.000 This is what I presented to the White House.\n00:05:51.000 Our goal is a delightfully diverse, safe, healthy and just world,\n00:05:54.000 with clean air, clean water, soil and power --\n00:05:57.000 economically, equitably, ecologically and elegantly enjoyed, period.\n00:06:01.000 (Applause)\n00:06:04.000 What don't you like about this?\n00:06:07.000 Which part of this don't you like?\n00:06:09.000 So we realized we want full diversity,\n00:06:11.000 even though it can be difficult to remember what De Gaulle said\n00:06:14.000 when asked what it was like to be President of France.\n00:06:16.000 He said, "What do you think it's like trying to run a country with 400 kinds of cheese?"\n00:06:20.000 But at the same time, we realize that our products are not safe and healthy.\n00:06:23.000 So we've designed products\n00:06:25.000 and we analyzed chemicals down to the parts per million.\n00:06:27.000 This is a baby blanket by Pendleton that will give your child nutrition\n00:06:30.000 instead of Alzheimer's later in life.\n00:06:32.000 We can ask ourselves, what is justice,\n00:06:34.000 and is justice blind, or is justice blindness?\n00:06:38.000 And at what point did that uniform turn from white to black?\n00:06:43.000 Water has been declared a human right by the United Nations.\n00:06:46.000 Air quality is an obvious thing to anyone who breathes.\n00:06:48.000 Is there anybody here who doesn't breathe?\n00:06:51.000 Clean soil is a critical problem -- the nitrification, the dead zones\n00:06:54.000 in the Gulf of Mexico.\n00:06:56.000 A fundamental issue that's not being

addressed.\n00:06:58.000 We've seen the first form of solar energy\n00:07:00.000 that's beat the hegemony of fossil fuels in the form of wind\n00:07:03.000 here in the Great Plains, and so that hegemony is leaving.\n00:07:06.000 And if we remember Sheikh Yamani when he formed OPEC,\n00:07:09.000 they asked him, "When will we see the end of the age of oil?"\n00:07:12.000 I don't know if you remember his answer, but it was,\n00:07:15.000 "The Stone Age didn't end because we ran out of stones."\n00:07:19.000 We see that companies acting ethically in this world\n00:07:23.000 are outperforming those that don't.\n00:07:24.000 We see the flows of materials in a rather terrifying prospect.\n00:07:29.000 This is a hospital monitor from Los Angeles, sent to China.\n00:07:32.000 This woman will expose herself to toxic phosphorous,\n00:07:35.000 release four pounds of toxic lead into her childrens' environment,\n00:07:38.000 which is from copper.\n00:07:40.000 On the other hand, we see great signs of hope.\n00:07:42.000 Here's Dr. Venkataswamy in India, who's figured out\n00:07:45.000 how to do mass-produced health.\n00:07:47.000 He has given eyesight to two million people for free.\n00:07:51.000 We see in our material flows that car steels don't become car steel again\n00:07:54.000 because of the contaminants of the coatings --\n00:07:56.000 bismuth, antimony, copper and so on.\n00:07:58.000 They become building steel.\n00:07:59.000 On the other hand, we're working with Berkshire Hathaway,\n00:08:01.000 Warren Buffett and Shaw Carpet,\n00:08:04.000 the largest carpet company in the world.\n00:08:05.000 We've developed a carpet that is continuously recyclable,\n00:08:08.000 down to the parts per million.\n00:08:11.000 The upper is Nylon 6 that can go back to caprolactam,\n00:08:14.000 the bottom, a polyolephine -- infinitely recyclable thermoplastic.\n00:08:17.000 Now if I was a bird, the building on my left is a liability.\n00:08:21.000 The building on my right, which is our corporate campus for The Gap\n00:08:24.000 with an ancient meadow, is an asset -- its nesting grounds.\n00:08:29.000 Here's where I come from. I grew up in Hong Kong,\n00:08:31.000 with six million people in 40 square miles.\n00:08:33.000 During the dry season, we had four hours of water every fourth day.\n00:08:37.000 And the relationship to landscape was that of farmers who have been\n00:08:40.000 farming the same piece of ground for 40 centuries.\n00:08:44.000 You can't farm the same piece of ground for 40 centuries\n00:08:46.000 without understanding nutrient flow.\n00:08:49.000 My childhood summers were in the Puget Sound of Washington,\n00:08:52.000 among the first growth and big growth.\n00:08:54.000 My grandfather had been a lumberjack in the Olympics,\n00:08:56.000 so I have a lot of tree karma I am working off.\n00:09:01.000 I went to Yale for graduate school,\n00:09:03.000 studied in a building of this style by Le Corbusier,\n00:09:05.000 affectionately known in our business as Brutalism.\n00:09:09.000 If we look at the world of architecture,\n00:09:12.000 we see with Mies' 1928 tower for Berlin,\n00:09:15.000 the question might be, "Well, where's the sun?"\n00:09:17.000 And this might have worked in Berlin, but we built it in Houston,\n00:09:20.000 and the windows are all closed. And with most products\n00:09:23.000 appearing not to have been designed for indoor use,\n00:09:25.000 this is actually a vertical gas chamber.\n00:09:28.000 When I went to Yale, we had the first energy crisis,\n00:09:31.000 and I was designing the first solar-heated house in Ireland\n00:09:33.000 as a student, which I then built --\n00:09:35.000 which would give you a sense of my ambition.\n00:09:37.000 And Richard Meier, who was one of my teachers,\n00:09:39.000 kept coming over to my desk to give me criticism,\n00:09:41.000 and he would say, "Bill, you've got to

understand- --\n00:09:43.000 solar energy has nothing to do with architecture."\n00:09:51.000 I guess he didn't read Vitruvius.\n00:09:53.000 In 1984, we did the first so-called "green office" in America\n00:09:57.000 for Environmental Defense.\n00:09:58.000 We started asking manufacturers what were in their materials.\n00:10:01.000 They said, "They're proprietary, they're legal, go away."\n00:10:03.000 The only indoor quality work done in this country at that time\n00:10:05.000 was sponsored by R.J. Reynolds Tobacco Company,\n00:10:08.000 and it was to prove there was no danger\n00:10:09.000 from secondhand smoke in the workplace.\n00:10:12.000 So, all of a sudden, here I am, graduating from high school in 1969,\n00:10:16.000 and this happens, and we realize that "away" went away.\n00:10:19.000 Remember we used to throw things away, and we'd point to away?\n00:10:23.000 And yet, NOAA has now shown us, for example --\n00:10:25.000 you see that little blue thing above Hawaii?\n00:10:27.000 That's the Pacific Gyre.\n00:10:28.000 It was recently dragged for plankton by scientists,\n00:10:30.000 and they found six times as much plastic as plankton.\n00:10:34.000 When asked, they said, "It's kind of like a giant toilet that doesn't flush."\n00:10:39.000 Perhaps that's away.\n00:10:40.000 So we're looking for the design rules of this --\n00:10:42.000 this is the highest biodiversity of trees in the world, Irian Jaya,\n00:10:44.000 259 species of tree, and we described this\n00:10:48.000 in the book, "Cradle to Cradle."\n00:10:49.000 The book itself is a polymer. It is not a tree.\n00:10:53.000 That's the name of the first chapter -- "This Book is Not a Tree."\n00:10:56.000 Because in poetics, as Margaret Atwood pointed out,\n00:10:59.000 "we write our history on the skin of fish\n00:11:01.000 with the blood of bears."\n00:11:04.000 And with so much polymer, what we really need\n00:11:05.000 is technical nutrition, and to use something\n00:11:08.000 as elegant as a tree -- imagine this design assignment:\n00:11:11.000 Design something that makes oxygen, sequesters carbon,\n00:11:13.000 fixes nitrogen, distills water, accrues solar energy as fuel,\n00:11:17.000 makes complex sugars and food, creates microclimates,\n00:11:21.000 changes colors with the seasons and self-replicates.\n00:11:27.000 Well, why don't we knock that down and write on it?\n00:11:29.000 (Laughter)\n00:11:35.000 So, we're looking at the same criteria\n00:11:37.000 as most people -- you know, can I afford it?\n00:11:39.000 Does it work? Do I like it?\n00:11:41.000 We're adding the Jeffersonian agenda, and I come from Charlottesville,\n00:11:43.000 where I've had the privilege of living in a house designed by Thomas Jefferson.\n00:11:47.000 We're adding life, liberty and the pursuit of happiness.\n00:11:53.000 Now if we look at the word "competition,"\n00:11:54.000 I'm sure most of you've used it.\n00:11:56.000 You know, most people don't realize it comes from\n00:11:57.000 the Latin competere, which means strive together.\n00:12:00.000 It means the way Olympic athletes train with each other.\n00:12:03.000 They get fit together, and then they compete.\n00:12:06.000 The Williams sisters compete -- one wins Wimbledon.\n00:12:08.000 So we've been looking at the idea of competition\n00:12:11.000 as a way of cooperating in order to get fit together.\n00:12:15.000 And the Chinese government has now --\n00:12:16.000 I work with the Chinese government now --\n00:12:18.000 has taken this up.\n00:12:20.000 We're also looking at survival of the fittest,\n00:12:22.000 not in just competition terms in our modern context\n00:12:24.000 of destroy the other or beat them to the ground,\n00:12:27.000 but really to fit together and build

niches\n00:12:29.000 and have growth that is good.\n00:12:31.000 Now most environmentalists don't say growth is good,\n00:12:33.000 because, in our lexicon, asphalt is two words: assigning blame.\n00:12:38.000 But if we look at asphalt as our growth,\n00:12:41.000 then we realize that all we're doing is destroying\n00:12:43.000 the planetary's fundamental underlying operating system.\n00:12:47.000 So when we see E equals mc squared come along, from a poet's perspective,\n00:12:52.000 we see energy as physics, chemistry as mass,\n00:12:54.000 and all of a sudden, you get this biology.\n00:12:56.000 And we have plenty of energy, so we'll solve that problem,\n00:12:59.000 but the biology problem's tricky, because as we put through\n00:13:02.000 all these toxic materials that we disgorge,\n00:13:05.000 we will never be able to recover that.\n00:13:07.000 And as Francis Crick pointed out, nine years\n00:13:09.000 after discovering DNA with Mr. Watson,\n00:13:12.000 that life itself has to have growth as a precondition --\n00:13:16.000 it has to have free energy, sunlight\n00:13:18.000 and it needs to be an open system of chemicals.\n00:13:21.000 So we're asking for human artifice to become a living thing,\n00:13:24.000 and we want growth, we want free energy from sunlight\n00:13:26.000 and we want an open metabolism for chemicals.\n00:13:29.000 Then, the question becomes not growth or no growth,\n00:13:31.000 but what do you want to grow?\n00:13:34.000 So instead of just growing destruction,\n00:13:36.000 we want to grow the things that we might enjoy,\n00:13:38.000 and someday the FDA will allow us to make French cheese.\n00:13:41.000 So therefore, we have these two metabolisms,\n00:13:45.000 and I worked with a German chemist, Michael Braungart,\n00:13:47.000 and we've identified the two fundamental metabolisms.\n00:13:49.000 The biological one I'm sure you understand,\n00:13:51.000 but also the technical one, where we take materials\n00:13:53.000 and put them into closed cycles.\n00:13:55.000 We call them biological nutrition and technical nutrition.\n00:13:58.000 Technical nutrition will be in an order of magnitude of biological nutrition.\n00:14:02.000 Biological nutrition can supply about 500 million humans,\n00:14:05.000 which means that if we all wore Birkenstocks and cotton,\n00:14:07.000 the world would run out of cork and dry up.\n00:14:10.000 So we need materials in closed cycles,\n00:14:12.000 but we need to analyze them down to the parts per million\n00:14:14.000 for cancer, birth defects, mutagenic effects,\n00:14:17.000 disruption of our immune systems, biodegradation, persistence,\n00:14:20.000 heavy metal content, knowledge of how we're making them\n00:14:23.000 and their production and so on.\n00:14:25.000 Our first product was a textile where we analyzed 8,000 chemicals\n00:14:29.000 in the textile industry.\n00:14:30.000 Using those intellectual filters, we eliminated [7,962.]\n00:14:35.000 We were left with 38 chemicals.\n00:14:37.000 We have since databased the 4000 most commonly used chemicals\n00:14:40.000 in human manufacturing, and we're releasing this database into the public in six weeks.\n00:14:45.000 So designers all over the world can analyze their products\n00:14:47.000 down to the parts per million for human and ecological health.\n00:14:52.000 (Applause)\n00:14:57.000 We've developed a protocol so that companies can send\n00:15:00.000 these same messages all the way through their supply chains,\n00:15:03.000 because when we asked most companies we work with -- about a trillion dollars\n00:15:06.000 -- and say, "Where does your stuff come from?" They say, "Suppliers."\n00:15:08.000 "And where does it go?"\n00:15:10.000 "Customers."\n00:15:11.000 So we need some help there.\n00:15:12.000 So the biological nutrients, the first fabrics --\n00:15:14.000

the water coming out was clean enough to drink.\n00:15:16.000 Technical nutrients -- this is for Shaw Carpet, infinitely reusable carpet.\n00:15:20.000 Here's nylon going back to caprolactam back to carpet.\n00:15:23.000 Biotechnical nutrients -- the Model U for Ford Motor,\n00:15:26.000 a cradle to cradle car -- concept car.\n00:15:28.000 Shoes for Nike, where the uppers are polyesters, infinitely recyclable,\n00:15:32.000 the bottoms are biodegradable soles.\n00:15:35.000 Wear your old shoes in, your new shoes out.\n00:15:37.000 There is no finish line.\n00:15:39.000 The idea here of the car is that some of the materials\n00:15:41.000 go back to the industry forever, some of the materials go back to soil --\n00:15:44.000 it's all solar-powered.\n00:15:46.000 Here's a building at Oberlin College we designed\n00:15:48.000 that makes more energy than it needs to operate and purifies its own water.\n00:15:52.000 Here's a building for The Gap, where the ancient grasses\n00:15:54.000 of San Bruno, California, are on the roof.\n00:15:58.000 And this is our project for Ford Motor Company.\n00:16:00.000 It's the revitalization of the River Rouge in Dearborn.\n00:16:02.000 This is obviously a color photograph.\n00:16:06.000 These are our tools. These are how we sold it to Ford.\n00:16:10.000 We saved Ford 35 million dollars doing it this way, day one,\n00:16:13.000 which is the equivalent of the Ford Taurus\n00:16:15.000 at a four percent margin of an order for 900 million dollars worth of cars.\n00:16:19.000 Here it is. It's the world's largest green roof, 10 and a half acres.\n00:16:22.000 This is the roof, saving money,\n00:16:25.000 and this is the first species to arrive here. These are killdeer.\n00:16:29.000 They showed up in five days.\n00:16:32.000 And we now have 350-pound auto workers\n00:16:34.000 learning bird songs on the Internet.\n00:16:38.000 We're developing now protocols for cities --\n00:16:40.000 that's the home of technical nutrients.\n00:16:42.000 The country -- the home of biological. And putting them together.\n00:16:45.000 And so I will finish by showing you a new city\n00:16:47.000 we're designing for the Chinese government.\n00:16:49.000 We're doing 12 cities for China right now,\n00:16:52.000 based on cradle to cradle as templates.\n00:16:54.000 Our assignment is to develop protocols for the housing\n00:16:57.000 for 400 million people in 12 years.\n00:16:59.000 We did a mass energy balance -- if they use brick,\n00:17:01.000 they will lose all their soil and burn all their coal.\n00:17:04.000 They'll have cities with no energy and no food.\n00:17:06.000 We signed a Memorandum of Understanding --\n00:17:08.000 here's Madam Deng Nan, Deng Xiaoping's daughter --\n00:17:10.000 for China to adopt cradle to cradle.\n00:17:12.000 Because if they toxify themselves, being the lowest-cost producer,\n00:17:16.000 send it to the lowest-cost distribution -- Wal-Mart --\n00:17:18.000 and then we send them all our money, what we'll discover is that\n00:17:21.000 we have what, effectively, when I was a student,\n00:17:24.000 was called mutually assured destruction.\n00:17:27.000 Now we do it by molecule. These are our cities.\n00:17:30.000 We're building a new city next to this city; look at that landscape.\n00:17:33.000 This is the site.\n00:17:35.000 We don't normally do green fields, but this one is about to be built,\n00:17:39.000 so they brought us in to intercede.\n00:17:41.000 This is their plan.\n00:17:43.000 It's a rubber stamp grid that they laid right on that landscape.\n00:17:46.000 And they brought us in and said, "What would you do?"\n00:17:49.000 This is what they would end up with, which is another color photograph.\n00:17:53.000 So this is the existing site, so this is what it looks like now,\n00:17:56.000 and here's our proposal.\n00:17:58.000 (Applause)\n00:18:02.000 So the way we approached

this\n00:18:04.000 is we studied the hydrology very carefully.\n00:18:06.000 We studied the biota, the ancient biota,\n00:18:08.000 the current farming and the protocols.\n00:18:10.000 We studied the winds and the sun to make sure everybody in the city\n00:18:12.000 will have fresh air, fresh water and direct sunlight\n00:18:18.000 in every single apartment at some point during the day.\n00:18:21.000 We then take the parks and lay them out as ecological infrastructure.\n00:18:25.000 We lay out the building areas.\n00:18:28.000 We start to integrate commercial and mixed use\n00:18:29.000 so the people all have centers and places to be.\n00:18:32.000 The transportation is all very simple,\n00:18:34.000 everybody's within a five-minute walk of mobility.\n00:18:37.000 We have a 24-hour street, so that there's always a place that's alive.\n00:18:42.000 The waste systems all connect.\n00:18:44.000 If you flush a toilet, your feces will go to the sewage treatment plants,\n00:18:49.000 which are sold as assets, not liabilities.\n00:18:51.000 Because who wants the fertilizer factory that makes natural gas?\n00:18:55.000 The waters are all taken in to construct the wetlands for habitat restorations.\n00:19:00.000 And then it makes natural gas, which then goes back into the city\n00:19:04.000 to power the fuel for the cooking for the city.\n00:19:08.000 So this is -- these are fertilizer gas plants.\n00:19:10.000 And then the compost is all taken back\n00:19:13.000 to the roofs of the city, where we've got farming,\n00:19:15.000 because what we've done is lifted up the city,\n00:19:19.000 the landscape, into the air to -- to restore the native landscape\n00:19:26.000 on the roofs of the buildings.\n00:19:28.000 The solar power of all the factory centers\n00:19:31.000 and all the industrial zones with their light roofs powers the city.\n00:19:34.000 And this is the concept for the top of the city.\n00:19:36.000 We've lifted the earth up onto the roofs.\n00:19:40.000 The farmers have little bridges to get from one roof to the next.\n00:19:44.000 We inhabit the city with work/live space on all the ground floors.\n00:19:48.000 And so this is the existing city, and this is the new city.\n00:19:53.000 (Applause)\n\nThe file is too long and its contents have been truncated.\n", "extra": {"cited_message_idx": 12, "search_result_idx": null, "evidence_text": "source"}}}, {"start_ix": 1599, "end_ix": 1610, "citation_format_type": "tether_og", "metadata": {"type": "file", "name": "tactiq-free-transcript-IoRjz8iTVoo.txt", "id": "file-QAdtwx5q5xmFsPgGvYJdRiuF", "source": "my_files", "text": "# tactiq.io free youtube transcript\n# Cradle to cradle design | William McDonough\n# https://www.youtube.com/watch/IoRjz8iTVoo\n\n00:00:26.000 In 1962, with Rachel Carson's "Silent Spring,"\n00:00:30.000 I think for people like me in the world of the making of things,\n00:00:35.000 the canary in the mine wasn't singing.\n00:00:39.000 And so the question that we might not have birds\n00:00:42.000 became kind of fundamental to those of us wandering around\n00:00:45.000 looking for the meadowlarks that seemed to have all disappeared.\n00:00:48.000 And the question was, were the birds singing?\n00:00:51.000 Now, I'm not a scientist, that'll be really clear.\n00:00:55.000 But, you know, we've just come from this discussion of what a bird might be.\n00:00:59.000 What is a bird?\n00:01:00.000 Well, in my world, this is a rubber duck.\n00:01:04.000 It comes in California with a warning --\n00:01:06.000 "This product contains chemicals known by the State of California\n00:01:09.000 to cause cancer and birth defects or other reproductive harm."\n00:01:16.000 This is a bird.\n00:01:19.000 What kind of culture would produce a product of this kind\n00:01:22.000 and then label it and sell it to children?\n00:01:27.000 I think we have a design problem.\n00:01:30.000 Someone heard