Appendix I

Appendix I: Full table of the answers to the specified questions for each article

	Author(s)	SD combined with	Area of the case study	Main Characteristics that motivated combining	Most important benefits of combination	Enriched phase of SD	Theoretical consideration
1	Sanatani (1981)	Fuzzy set	The phenomena of market penetration or diffusion of new products in Segmented Populations	Fuzziness of some variables	Quantifying fuzzy concepts and parameters	Simulation phase	No mention in the article
2	Mohapatra & Sharma (1985)	Modal control theory	A company with two departments: distribution and manufacturing	No special characteristics	More rigorous method of policy design, discovering important information sources for designing realistic policies.	Simulation phase	No mention in the article
3	Coyle (1985)	Optimization	A simple model of unstable inventory dynamics	No special characteristics	Simulation via repeated optimization: for better analysis performance of SD models, it can be subjected to optimization analysis directly and immediately	Simulation phase	No mention in the article
4	Macedo (1989)	A reference model (optimization nonlinear model) and a control model (a linear quadratic: optimal control model with closed-loop solution)	Urban dynamics of POBSON model	No special characteristics	More robust policies	Simulation phase	No mention in the article

5	Dolado (1992)	Qualitative simulation	One of the most common	No special characteristics	Obtaining causal and dynamic	Conceptualization phase	No mention in the article
5	Doludo (1992)	Quantative simulation	macroeconomic models (Samuelson	The special characteristics	explanations; assistance in explaining	Conceptualization phase	to mention in the article
			1953; Dornbusch and Fisher 1984)		socio-economic models: helping		
			1909, Domousen und Fisher 1901)		reasoning in terms of subsystems:		
					facilitating comprehension of models		
					as well as forcing this reasoning to go		
					in a different way, as with numerical		
					simulations.		
6	Seth (1994)	Fuzzy set theoretic approach	A small hypothetical company which	No special characteristics	Providing a systematic procedure for	Simulation phase	No mention in the article
			deals in a non-durable consumer good		qualitative analysis of SD models,		
					incorporating subjective beliefs and		
					perceptions easily in an objective,		
					scientific and rational manner using		
					the concepts of fuzzy sets.		
7	Van Ackere &	Econometrics	Dynamics of National Health Service	No special characteristics	More secure estimates in formulation	Simulation phase	No mention in the article
	Smith (1999)		waiting lists				
8	Gill (1996)	Social fabric matrix	Development of the Australian	Data of social fabric matrix are based	Proposing a structured process to	SD is considered as	Mention
			pollination services market	on collective wisdom and are hard such	facilitate the active participation of	a Dependent method	
				that they could be used by system	system players in policy development.		
				dynamics models			
9	Schmidt & Gary	Conjoint analysis	Exploring pricing strategies for the	This case is a kind of multi-attribute	Improving the formulation and	Simulation phase	No mention in the article
	(2002)		company's existing product and	choice problems: behavioral policies of	validation of system dynamics models		
			analyze a variety of NPD options	decision makers include tradeoffs	and also, its policy analysis		
				among multiple attributes			
10	Powell & Coyle	Qualitative system dynamics	A company that becomes a target for a	Involving agents and groups of agents	Studying the motivations and powers	Conceptualization phase	No mention in the article
	(2005)	approach as QPID (Qualitative	group of activists who have threatened	in the system definition. A politicized	of agents and thereby producing		
		Politicized Influence Diagrams)	to adulterate its products in support of	system that is ubiquitous, particularly	naturally an output directed at action		
		5 - 7	their agenda and who have, in a few	in the strategic context, and in	planning at the strategic level, a		
			cases, actually succeeded in doing so.	managing them	complementary to numerical SD		
					approaches, deriving components of		
					strategic action directly from analysis.		

11	Liddell & Powell	Qualitative system dynamics	Improving patient access to general	It is a kind of Hybrid management	Ascribing agents and actors to the	Conceptualization phase	No mention in the article
	(2004)	approach as QPID (Qualitative	practice	problems: Access to general practice	connections in an influence diagram		
		Politicized Influence Diagrams).		constitutes a hybrid system, having	of the system, structuring thinking		
				qualitative and quantitative	about the appropriate actions (aimed		
				(quantifiable) variables	at these agents and actors) for		
					managing the system behavior,		
					deriving practical action plans for the		
					management of challenges.		
12	Schwaninger	Viable Systems Modeling (VSM)	Regional Innovation and Technology	Multi-stakeholders, multi-level	Bringing the multiple actors together	Conceptualization phase	Mention
	(2004)		Transfer System (RITTS)		and help actors at different levels to		
					achieve the requisite variety,		
					simultaneous operation of the process		
					at the content as well as at the context		
					levels		
13	Rodriguez-Ulloa	Soft Systems Methodology	A small Peruvian company dedicated	(High) Ambiguity in the problem,	Introducing explicitly the observer's	Conceptualization phase	Mention
	& Paucar-Caceres		to commercialize national and	conflict, multi-aspect	weltanschauung and the observer's		
	(2005)		imported steel products		role in SSDM studies		
14	Haslett & Sarah	Viable Systems Modeling (VSM)	Policy design in the Australian	Long-term capability developmental	Developing the formal organizational	Conceptualization phase	No mention in the article
	(2006)		Taxation Office	process, client involvement, emphasis	and political structures and processes		
				on the structure and process of an	necessary to support a SD		
				organizational change, context based	intervention in a large bureaucracy,		
					rather than modeling per se.		
15	Howick et al.	Event map of scenarios	The renewable energy market in the	Client center	Improving the value of the project to	Conceptualization phase	No mention in the article
	(2006)		U.K.'s electric power grid		the client group by enabling them to		
					visualize the links between the		
					scenarios and the over-time dynamics		
					that they produced, stronger analysis		
					and a heightened degree of robustness		
i							

16	Daim et al. (2006)	Data collection: Patent Analysis,	Forecasting technologies in fuel cell,	No historical data available, existence	A more complete forecasting	Conceptualization and	No mention in the article
ľ		Bibliometrics, Analogies, Delphi	food safety and optical storage	of several organizational factors	methodology (Using SD as a platform	simulation phase	
ľ		Relationship building:	technologies.	(political, cultural and etc.), technical	for integrating different related	(likely to be a pivotal method	
ľ		Delphi,SD		trend analysis alone usually cannot	methodologies)	but not actually a dominant	
I				incorporate the organizational and		one)	
I		Diffusion/forecasting:SD,Scenarios,		political scenarios			
ľ		Growth curves					
17	Santos et al.	Multiple-criteria decision analysis	Measurement and improvement of	Wide range of views by multiple	Aid of SD in exploring multiple, often	Simulation phase	No mention in the article
I	(2008)	(MCDA)	performance in radiotherapy	stakeholders	conflicting, goals		
ľ			departments				
18	Kunsch &	Fuzzy techniques	Design a coherent and efficient	Dynamic and structural aspects of the	Keeping all available information,	Simulation phase	No mention in the article
I	Springael (2008)		strategic plan for a CO2 tax scheme	problem, uncertainties on time-	merging available data sets according		
I			over a medium-term horizon, e.g. five	dependent key parameters or	to their respective credibility factors.		
ľ			years.	exogenous variables.			
19	Adamides et.al	Soft Systems Methodology and	Management of urban and industrial	a social issue that, beyond the purely	Improving the wholeness of SD	Conceptualization and	No mention in the article
ľ	(2009)	multi-objective optimization in an	solid waste	technical, extends to both the practical	models in considering socio-economic	simulation phases	
I		action research project		(interpretivist) and emancipatory	factors		
I				spheres of interest of the social subjects			
I				involved; multiple, subjective views;			
I				sensitivity of the public over the			
ľ				problem			
20	Duggan (2008)	A new optimization approach based	Linear supply chain network, four-	Composed of A network of N agents, A	Allows for the varying of policy	Simulation phase	No mention in the article
ľ		on genetic algorithms	agent Beer game example	set of M agent strategies, A set of agent	equations in order to discover the best		
ľ				parameters.	strategies for a given problem; its		
ľ					scalability, in terms of the ease in		
ľ					adding new agents, and also how		
ľ					flexible it is if the modeler wishes to		
ľ					add new policies		

and yuical components: linearization of the model, loop eigenvalue elasticity analysis (LEEA), and dynamic decomposition weights (DDW)workforce modeland serve and components: linearization (DDW)workforce modeland formal way than the exhaustive exploratory approaches; enables a much more efficient search for leverage policies, by ranking the influence of each model parameter without the need for multiple simulation experimentsLeverage policies, by ranking the influence of each model parameter without the need for multiple simulation experimentsConceptualization and simulation experimentsNo mention in the article and lower layers22Wu et.al (2010)Agent-based modeling perspective componentsTechnological innovation risk decision-making in an entrepreneurial team for typical enterprisesUncertainties and conflicting information, Some relevant and conflicting objectives between upper and lower layersNew planning or decision-making ideas that improves the basic function of each agent and understanding the system from Agents' interaction, facilitates to organize the system by use of Modular Style sheets.Conceptualization phaseNo mention in the article social system for use of Modular Style sheets.23Rodríguez-Ulloa et.al (2011)Soft Systems Methodology (SSM)Citizen insecurity in the Province of Mendoza, ArgentiniaNo special characteristicsOrchestrate and implant change in social systemsConceptualization phaseMention	21	Saleh et. al (2010)	Policy analysis involves three	A simplified version of the inventory-	Dampened oscillation	policy analysis in a more structured	Simulation phase	No mention in the article
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the genetic algorithms(GA) the algorithm to search for the most appropriate model(s) that can fit it without heuristic objective functions or eigenvalues. Second, both the system structure and its parameter values evolve simultaneously during the the genetic algorithm the genet	23	Chen et.al (2011)		Conventional world dynamics	-		Simulation phase	No mention in the article
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26	Liu (2011)	Fuzzy logic	Sales and service model	Linguistic and soft variables in the model	Providing an alternative approach to incorporate linguistic variables in dynamics modeling process.	Simulation phase	No mention in the article
27	Kim & Andersen (2012)	Grounded theory	Economic system	"purposive" text data as a source of causal structures.	Using grounded theory to identify problems, key variables, and their structural relationships from purposive text data. Adding more confidence, rigor and flexibility in the modeling.	conceptualization phase	Mention
28	Liu et. Al (2012)	The coevolutionary approach	The beer distribution game (BDG): a multi-sector SD structure	Multiple independent actors who must coordinate a diverse set of decision policies, and whose decisions are intendedly rational, a kind of multi- sector models as an interconnected system of physical and information flows, where each sector is autonomous.	Offering an additional, powerful dimension to policy exploration that can be viewed as a computational extension of the ideas of partial model testing. The distinction from normal optimization methods is that, with coevolutionary optimization, individual sectors in the model can be optimized to their own fitness functions, and since a fuller range of policy responses can be investigated.	Simulation phase	No mention in the article
29	Feola et.al (2011)	Coevolutionary method (genetic algorithms (GA))	Misuse of Personal Protective Equipment that results in health risk among smallholders in Columbia	Social dynamics in the model	Exploring behavioral dynamics together with the local experts who are responsible for implementing such strategies or to provide the guidelines for it; The model was mostly used as a learning tool, which facilitated filling the gap between science and policy making	Simulation phase	No mention in the article
30	Kopainsky et.al (2012)	Conjoint analysis	Adoption of seed from improved maize varieties in Malawi	Tangible and intangible attributes besides a social dynamics factor (trust)	Allows to elicit choice preferences of stakeholders in detail and to add precision to the structure of the model	Simulation phase	No mention in the article

31	Chen et al. (2012)	Delphi method	A technology foresight case study in	Mostly under the auspices of central	Identifying and evaluating key factors	Conceptualization phase	No mention in the article
51	Cheff et ul. (2012)	Delphi method	the Chinese information and	governments, involving hundreds to	(variables) by nationwide experts	conceptualization phase	to mention in the utility
			communication technologies (ICT)	thousands of experts from government,	through Delphi surveys		
			industry	industry, academia, and research			
				agencies in a multi-year			
32	Yearworth &	Grounded theory	Three case studies from the domains of	Qualitative data collection and analysis	Improving dynamic sensibility in the	Conceptualization phase	Mention
	White (2013)		organizational change and		process of qualitative data analysis,		
			entrepreneurial studies		providing a more rigorous approach to		
					developing CLDs in the formation		
					stage of system dynamics modeling		
33	Lee (2013)	Econometrics (applied and proven in	The future of transportation	No special characteristics	Can have a sound theoretical	Simulation and	No mention in the article
		various studies of the Bass diffusion			background by developing the causal	conceptualization phases	
		model, discrete choice model and			loop diagram which is based on the		
		etc.)			proven econometrics model		
34	Kwakkel et al.	Exploratory Modeling and analysis	Copper scarcity	Uncertainty derived from profoundly	Extending the scenario discovery	Simulation phase	No mention in the article
	(2013)	(EMA)		diverging views in demand side of the	approach conceptually, technically,		
				problem.	and practically		
35	Kwakkel & Pruyt	Exploratory modeling and analysis	Plausible dynamics for mineral and	Parametric uncertainties, orders of time	Help to gain insight into what kinds of	SD is considered as	No mention in the article
	(2013)	(EMA)	metal scarcity	delays, non-linear lookups	surprising dynamics can occur given a	a dependent method	
					variety of uncertainties and a basic		
					understanding of the system. It is		
					more about EMA rather than SD.		
36	Anderson et al.	Control theory and signal analysis	A simplified but representative model	varying variables and information	More robust policy analysis	Simulation phase	No mention in the article
	(2005)	techniques	of service supply chains	sharing			
37	Coyle et al. (1999)	Cognitive mapping and Mission	Naval command and control systems	Are dependent on complex computer	Cognitive mapping was used to	Conceptualization phase	No mention in the article
		Oriented Analysis (MOA)	effectiveness assessment	systems, are complex, difficult to	identify the processes in the system;		
				evaluate because of the need to take	Mission Oriented Analysis (MOA)		
				into account human	was used to structure the inputs to the		
				decision making, the need	model		
				to assess potential system performance			
				over a wide range of operational			
				circumstances			

 using real world data) Geomapping and statistical a consisted of multivariate regranalysis, and tree-based regro 	software: first optimization in SD period distribution: epidemiology of using real world data) AIDS Geomapping and statistical analysis Healthcare: improving the cost- consisted of multivariate regression effectiveness of chlamydia screening analysis, and tree-based regression with targeted screening strategies	incubation period of AIDS It constitutes a major public Health concern, multi-disciplinary problem	hypothetical or generic models: genuinely useful approach to the statistical problems of estimating best fit probability distribution when the underlying data is right-censored Provided a unique holistic view of the problem by the contribution of the	Conceptualization and	
 Geomapping and statistical a consisted of multivariate regr analysis, and tree-based regro 	Geomapping and statistical analysis Healthcare: improving the cost-effectiveness of chlamydia screening analysis, and tree-based regression with targeted screening strategies	Health concern, multi-disciplinary	statistical problems of estimating best fit probability distribution when the underlying data is right-censored Provided a unique holistic view of the	Conceptualization and	
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analysis, and tree-based regre	analysis, and tree-based regression with targeted screening strategies		problem by the contribution of the		No mention in the article
		problem		simulation phases	
analyses(CART and CHAID	analyses(CART and CHAID)		following methods: The geomapping		
			work: using the software MapInfo,		
			allowed for the spreading patterns and		
			infection clusters to be observed. The		
			analysis of socio-economic		
			indicators: using regression models		
			and tree-based classification trees		
			identified high-risk groups within the		
			population for screening intervention		
			targeting. The SD model: built using		
			the software vensim, captured the		
			infection dynamics and cost-		
			effectiveness of screening using		
			strategies informed by the previous		
			two components		
Extensive numerical investig	Extensive numerical investigation Long-term capacity planning in the	Uncertainty in variables (actual	Providing more feasible flexible	Simulation phase	No mention in the article
Ē	3) within a simulation-based system reverse channel of a two-product	demand, sales patterns, quality and	policies as improved alternatives		
5	dynamics optimization approach closed-loop supply chains (CLSCs)	timing of end-of-use product returns)			
2013) within a simulation-based sys	with remanufacturing activities, under				
2013) within a simulation-based sys					
2013) within a simulation-based sys	a high cost setting regarding				
2013) within a simulation-based sys	a high cost setting regarding investment decisions in				
		a high cost setting regarding	a high cost setting regarding	a high cost setting regarding	a high cost setting regarding

41	Homer (1999)	Stochastic job queuing model	Field service dynamics	A case in which a key table function	Firm policy conclusion	Simulation phase	No mention in the article
				affecting service readiness could only			but speak greatly on the
				be properly estimated by analyzing a			multi-methodology
				separate micro-level model, a model			practice
				that mimics the daily queueing of			
				service jobs and their assignment to			
				individual field engineers.			
42	Joglekar & Ford	Control theory model	Product development resource	No special characteristics (the inherent	To specify a foresighted policy, which	Simulation phase	No mention in the article
	(2005)		allocation	closed loop flow of development work	is tested with the system dynamics		
				and the dynamic demand patterns of	model; to derive insights that are not		
				work backlogs. Projects selected are	available by either alone, but at the		
				described with two important	cost of limiting the range of		
				development	applicability of the results		
				project characteristics: complexity and			
				concurrence).			
43	Olaya & Dyner	Optimization	Policy assessment in the natural gas	In the natural gas industry, each	The analysis platform handles the	Simulation phase	No mention in the article
	(2005)		industry	component has its own specific	system complexity being modelled,		
				features and, when analyzed as a single	improves its understanding and		
				whole, a synthesized modeling	widens the perspectives of analysts		
				approach may turn appropriate; The	and policy-makers.		
				increased number of actors and			
				transactions, along with the			
				deregulation of the market and the			
				limitation of transportation capacity,			
				generate additional uncertainty in the			
				security of the natural gas supply.			
44	Burcu et al. (2010)	(Monte Carlo simulations and)	Wind power industry	Numerous uncertainties and high	Enables handling multiple	Simulation phase	No mention in the article
		decision tree analysis		managerial flexibility	endogenous sources of uncertainty		
					efficiently with less vulnerability to		
					"the curse of dimensionality";		
					Enables a backwards induction		
					solution approach to evaluate the		
					project;		
					Decision tree analysis provides an		
					intuitive approach in modeling		
					managerial flexibility and discrete		
					approximations of project uncertainty		

45	Toro & Aracil	Qualitative theory of nonlinear	Ecological systems: predator-prey and	The cyclic behavior that can be	The analysis gives insight into the link	Simulation phase	No mention in the article
	(1988)	dynamic systems (Bifurcation	the Kaibab plateau models	periodic, in which	between the structure of the model		
		Analysis: Hopf and Lotka-Volterra		case the attractor is a limit cycle; or	and its behavior modes; The		
		Types)		aperiodic, resulting in a quasi-periodic	interaction between mental models		
				orbit or a chaotic attractor	and all the behavior modes they can		
					generate, emphasized by Forrester		
					(1987), can be better understood with		
					the help of qualitative techniques		

Appendix II

In this table, initially, we separate main characteristics of each paper that motivated combination of SD with others from table 1 in the appendix. Then, regardless of the research problem that may have more than one specific feature, start the coding procedure. We have obtained 4 main synthesized concepts as can be seen in the table.

Related category	Synthesized concept	Characteristics of the problems addressed in each selected paper
		that motivated combination of SD with other methodologies, methods
		and techniques
1. Sources of Data	a) Characteristics that are related to the involved agents and their	Multiple stakeholders
	divergent views	• Involving agents and groups of agents in the system definition.
		Client involvement, Client center
		 Involving hundreds to thousands of experts from government, industry, academia, and research agencies
		• Multiple independent actors who must coordinate a diverse set of decision policies, and whose decisions are intendedly rational, a kind of multi-sector models as an interconnected system of physical and information flows, where each sector is autonomous
		Uncertainty derived from profoundly diverging viewsWide range of views
		• The problem is a social issue that, beyond the purely technical, extends to both the practical (interpretivist) and emancipatory spheres of interest of the social subjects involved.

Appendix III: Coding procedure for finding the characteristics of the research problems

		 It involves a kind of social dynamics Composed of A network of N agents, A set of M agent strategies, A set of agent parameters (structure of the problem) Multiple, subjective views
		• Relevant and conflicting objectives between upper and lower layers
2. Content of data	b) Characteristics that are related to the variables and formulations of causal relations	 Quantitative and qualitative data Linguistic and soft variables in the model Uncertainty in variables. varying variables and information sharing Uncertainties and conflicting information Uncertainties on time-dependent key parameters or exogenous variables Tangible and intangible attributes besides social dynamics factor(trust) Behavioral policies of decision makers include tradeoffs among multiple attributes Parametric uncertainties, orders of time delays, non-linear lookups Human decision making Dampened oscillation behavior Existence of data from Social Fabric Matrix (that are based on collective wisdom and are hard such that they could be used by system dynamics models.) No historical data available
	c) Characteristics that are related to the nature of the problems	 "Purposive" text data as a source of causal structures Multi-level, multi-aspect Multi-disciplinary; several organization factors—political, cultural, etc. Complexity Dynamic and structural aspects of the problem (High) Ambiguity in the problem Queueing nature of problem Many ideas and relationships that are obscured in our unreliable intuition about dynamics A system of continuous flows of time-varying commodities interrelated by complex nonlinear feedback and coupling mechanisms Qualitative data collection and analysis Each component has its own specific features and, when analyzed as a single whole, a synthesized modeling approach may turn appropriate Dependent on complex computer systems Cyclic behavior that can be periodic

		 Long-term capability developmental process Wide range of operational circumstances Emphasis on the structure and process of an organizational change The relevance of human decision making
3. Context of data	d) Characteristics that are related to the contexts of the problematic situation	 A politicized system (that is ubiquitous, particularly in the strategic context, and in managing them it is necessary to take the political aspects of power into account at an early stage in the analysis). Mostly under the auspices of central governments High managerial flexibility Sensitivity of the public over the problem A major public Health concern

Appendix IV

In this table, initially, we separate benefits of each combination for SD from table 1 in the appendix. Then, start the coding procedure. We have obtained 4 main synthesized concepts as can be seen in the following table.

Synthesized concept: Improved capabilities of system dynamics modeling as a result of combination	Benefits of methods in each selected paper for system dynamics modeling
1. Improved capabilities in obtaining and quantifying non-objective information	 Incorporating subjective beliefs and perceptions Quantifying fuzzy concepts and parameters Keeping all available information, and merging available data sets according to their respective credibility factors. More holistic way in considering socio-economic factors Identifying and evaluating key factors (variables) by nationwide experts through Delphi surveys. Providing an alternative approach to incorporate linguistic variables in dynamics modeling process. Identify problems, key variables, and their structural relationships from purposive text data.
2. Added confidence, rigor, precision and flexibility in the components of SD modelling	 Adding more confidence, rigor and flexibility in the modeling Better analysis performance of system dynamics Systematic procedure for qualitative analysis Secure estimate

Appendix III: Coding procedure for finding the benefits of combination for SD modeling

 Improving the formulation and validation of system dynamics models and also, its policy analysis Identifying the processes in the system (using Cognitive mapping) Improving dynamic sensibility in the process of qualitative data analysis, providing a more rigorous approach to develop CLDs in the formation stage of system dynamics modelling Sound theoretical background by developing the causal loop diagram which is based on the proven economic model. Improving the probable highly uncertain and influential relationships and parameters, and testing them for sensitivity analysis early enough in an efficient and effective way. Improving the performance of hypothetical or generic models: genuinely useful approach to the statistical problems of estimating best fit probability distribution when the underlying data is right-censored Enables handling multiple endogenous sources of uncertainty efficiently with less vulnerability to "the curse of dimensionality". More rigorous and robust policy exploration, design and analysis More rigorous method of policy design. Useful insights into possible future scenarios Designing realistic problems. Visualize the links between the scenarios and the over-time dynamics that they produced, stronger analysis and a heightened degree of robustness (could be more) A more complete forecasting methodology, using SD as a platform for integrating different related methodologies. Allows for the varying of policies. Perform the model's policy analysis in a nore structured and formal way than the exhaustive exploration dises are the adore wing of policies. Perform the model's policy analysis in a nore structured and formal way than the exhaustive exploration experiments. Firm policy conclusion More robust policies. This method enables a much more efficient search for leveraging p		
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nolicy maker can create an arbitrary desired reference mode directly and run the		policy maker can create an arbitrary desired reference mode directly and run the
algorithm to search for the most appropriate model(s) that can fit it without heuristic		
objective functions or eigenvalues. Second, both the system structure and its		

4. Consideration of agents and their influencing attributes and views in SD modelling	 parameter values evolve simultaneously during the search process. Providing more feasible flexible policies as improved alternatives Extending the scenario discovery approach conceptually, technically, and practically. To specify a foresighted policy, which is tested with the system dynamics model to derive insights that are not available by either alone, but at the cost of limiting the range of applicability of the results Offering an additional, powerful dimension to policy exploration that can be viewed as a computational extension of the ideas of partial model testing. The distinction from normal optimization methods is that, with coevolutionary optimization, individual sectors in the model can be optimized to their own fitness functions, and since a fuller range of policy responses can be investigated. Decision tree analysis provides an intuitive approach in modeling managerial flexibility and discrete approximations of project uncertainty. Can explore the search space in order to discover the best combination of parameters and equation-based strategies for a given system dynamics problem. Ascribing agents and actors to the connections in an influence diagram of the system Bringing the multiple actors together and help actors at different levels to achieve the requisite variety Active participation of system players in policy development. Introducing explicitly the observer's weltanschauung and the observer's role in SSD studies; Studying the motivations and powers of agents New planning or decision-making ideas that improves the basic function of each Agent and understanding the system from Agents' interaction, facilitates to organize the system by use of Modular Style sheets. Exploring behavioral dynamics together with the local experts who are responsible for implementing such strategies or to provide the guidelines for it. The model was mostly used as a learning tool, which facilitated f
5. Developing structures and processes for support of SD intervention and implementation	 Developing the formal organizational and political structures and processes necessary to support a system dynamics (SD) intervention in a large bureaucracy, rather than modelling per se. Simultaneous operation of the process at the content as well as at the context levels. Orchestrate and implant change in social systems, based on a multi-methodological and multi-paradigmatic approach