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Literature review: Strategic network optimization models in waste reverse supply chains — Source link

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Literature Review: Strategic Network Optimization Models in Waste Reverse Supply Chains - Online Appendix

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Table A.1: Network type of reviewed papers. Reuse and repair refer generally to the final product level. Refurbished products or parts needed clean up, a new layer of paint and/or reparation. The remanufacturing process might provide a product with new parts. Recovery at the materials level is classified as recycling. Treatment indicates whether the stream of products is subjected to a procedure before final disposal, for example thermal treatment. Some models do only model part of a network, or do not specify the recovery option. These models are classified as "not specified/general".

	recovery option	1995-1998	1999-2002	2003-2006	2007-2009	2010-2012	2013-2015	2016-2017
open loop	reuse				[71]		[201], [67]	[104], [214]
	repair				[71]		[213]	[104], [215], [76]
	refurbish				[71]		[230], [208]	[215]
	remanufacture		[280]			[163], [83], [79]	[238], [230], [213]	[86], [222], [104], [215], [243], [127], [76], [105]
	recycling	[174], [88]	[188], [189]	[89], [259]	[156], [281], [94], [71]	[129], [282], [163], [138], [122], [83], [178], [79], [112]	[283], [236], [201], [101], [135], [258], [245], [113], [238], [213], [165], [98], [118], [130], [199], [255], [208], [114], [160], [95]	[86], [103], [104], [214], [284], [151], [127], [285], [76], [260], [207], [187]
	(thermal) treatment	[174]			[99]	[129], [100],	[101], [102], [114]	[103], [104], [284], [149], [286], [127], [285]
	final disposal	[174]	[287]	[195]	[196]	[129], [100], [83], [288], [79], [289]	[283], [201], [101], [113], [213], [130], [199], [208], [114], [160], [119]	[86], [103], [222], [104], [214], [284], [149], [286], [215], [285], [76], [207], [290], [263]
	not specified/general				[246], [233]	[139], [289]	[235], [191], [291], [237], [231], [171]	[248], [180], [126], [134], [181]
closed loop	reuse						[64], [65], [66], [292]	[261], [293], [69], [68]
	repair			[70]		[294]	[183], [202], [266], [143]	[261], [72], [73], [240], [148], [74], [75], [192], [186], [153]
	refurbish						[197], [159], [228], [212], [184], [202], [65], [77], [172], [173]	[145], [78], [69], [75], [192]
	remanufacture			[70], [136]	[108]	[15], [190], [234], [203], [295], [294], [168], [84], [223], [158], [242]	[197], [169], [227], [159], [228], [212], [182], [183], [184], [64], [221], [65], [266], [226], [77], [142], [143], [85], [81], [87], [166], [239], [91], [131], [224], [144]	[194], [124], [145], [209], [146], [78], [211], [161], [125], [204], [193], [154], [216], [73], [210], [162], [262], [148], [120], [296], [82], [297], [298], [167], [219], [217], [220], [241], [186], [128], [153]
	recycling			[70]	[93]	[157], [225], [190], [294], [155], [97], [200]	[140], [212], [183], [244], [205], [64], [202], [266], [229], [143], [85], [170], [87], [123], [90], [92], [179]	[145], [147], [78], [161], [73], [240], [148], [74], [69], [132], [150], [133], [121], [219], [192], [217], [152], [299], [300], [186]
	(thermal) treatment	[106]						
	final disposal			[70]	[93]	[157], [225], [15] , [203], [294], [84], [223], [200], [158]	[197], [169], [227], [140], [159], [228], [182], [183], [244], [184], [64], [221], [202], [65], [266], [229], [77], [142], [143], [85], [170], [81], [185], [87], [66], [206], [123], [172], [173], [232], [239], [131], [224], [247]	[124], [145], [146], [78], [211], [161], [204], [193], [154], [216], [73], [210], [162], [148], [74], [69], [75], [133], [121], [219], [192], [68], [152], [153]
	not specified/general				[109]		[164], [301], [141], [185], [206], [123], [232], [247]	[249]

Table A.2: Overview of models with a single objective. NIMBY = Not In My BackYard, characterizing opposition of affected residents. The “min. cost / max. revenue” objective represents cost (revenue) in general terms: total cost, total discounted cost, cost per product returned, etc.

	reference	min. cost	max. revenue	max. customer coverage	min. (walking) distance for end consumers	min. driving distance	max. products collected	min. NIMBY sentiments	min. carbon emissions
single	[174], [88], [287], [280], [89], [136], [218], [108], [246], [156], [281], [99], [157], [234], [163], [100], [138], [122], [203], [295], [288], [79], [168], [289], [84], [155], [200], [242], [164], [235], [140], [283], [236], [159], [291], [201], [244], [258], [231], [245], [141], [221], [65], [226], [77], [238], [230], [171], [165], [98], [143], [85], [130], [255], [170], [81], [185], [206], [123], [160], [292], [131], [247], [95] [86], [261], [146], [211], [204], [249], [154], [216], [222], [248], [73], [162], [262], [286], [297], [298], [150], [68], [285], [152], [76], [260], [207], [128], [181], [187], [153]	✓							
	[259], [109], [71], [93], [225], [294], [139], [223], [302], [158], [227], [183], [202], [266], [213], [118], [199], [208], [114], [66], [166], [239], [161], [125], [249], [293], [240], [148], [296], [167], [133], [219], [220], [300], [105]		✓						
	[233]			✓					
	[282]				✓				
	[178]						✓		
	[283]					✓			
	[237]							✓	
	[85]								✓
	[290]			✓					

Table A.3: Overview of multi-objective models. A no preference methods does not use information from a Decision Maker (DM), and a single optimal solution is given. In a priori methods, a DM has to give some preferences before the model is solved. An a posteriori method presents the entire range of efficient solutions. GP = Goal Programming, EA = Evolutionary Algorithm; WT = Weighted Tchebycheff method.

	method basis	reference	year	min. cost	max. revenue	max. population serviced / customer coverage	max. network responsiveness / products collected / recycled	min. waste / min. landfill space / max. volume reduction	max. product quality / min. defect rates	min. risk related to population exposure	min. tardiness / max. on time deliv.	min. political opposition / pop. affected / obnoxious effects	min. GHG / CO_2 emissions or cost / max. emission savings	min. energy use / max. energy recovery	max. environ. benefits / min. environ. impact	min. social impact / max. social benefit	min. financial / economic risk	other
no preference	min. distance parameter	[87]	2015	✓							✓							
a priori	fuzzy	[189]	2000			✓												✓
		[190]	2010	✓							✓							
		[97]	2012	✓														✓
		[228]	2013	✓														✓
		[212]	2013		✓													✓
		[205]	2013	✓														✓
		[184]	2014	✓														✓
		[102]	2014	✓				✓						✓				
		[144]	2015		✓						✓							✓
		[145]	2016	✓				✓					✓				✓	
		[209]	2016	✓													✓	
		[180]	2016	✓											✓	✓		
		[215]	2017		✓			✓										
		[126]	2017	✓														✓
		[127]	2017	✓											✓	✓		✓
		[186]	2017		✓	✓												✓
	GP	[94]	2008	✓					✓						✓			
	fuzzy GP	[179]	2015	✓		✓												✓
	lexicographic	[80]	2014	✓														✓
	predetermined weights	[301]	2013	✓							✓							
		[135]	2013	✓											✓	✓		
		[149]	2017	✓						✓		✓						
		[132]	2017	✓	✓		✓											
a posteriori	EA	[188]	1999			✓												✓
		[196]	2009	✓								✓						
		[15]	2010	✓			✓											
		[64]	2014	✓											✓	✓		
		[67]	2015	✓							✓							
		[224]	2015	✓	✓						✓							
		[243]	2017	✓			✓											
	weighted sum	[195]	2004	✓								✓						
		[129]	2010	✓								✓						
		[83]	2011	✓														✓
		[191]	2013	✓				✓			✓							
		[113]	2014	✓											✓	✓		
		[147]	2016	✓											✓			
		[193]	2016	✓											✓			
		[104]	2016	✓									✓					
		[74]	2016	✓	✓								✓					
		[121]	2017		✓								✓			✓		
		[217]	2017	✓											✓			
		[263]	2017	✓													✓	
	ϵ-constraint	[112]	2012	✓											✓			
		[182]	2013		✓		✓		✓									
		[142]	2014		✓				✓		✓							
		[90]	2015		✓										✓	✓		
		[232]	2015		✓													✓
		[194]	2016	✓									✓					
		[124]	2016		✓												✓	
		[210]	2016	✓									✓					
		[106]	2017	✓									✓					
		[151]	2017	✓											✓			✓
		[75]	2017	✓							✓							
		[192]	2017		✓										✓			
		[299]	2017		✓					✓								
		[134]	2017	✓		✓												
	lexicogr. WT	[101]	2013	✓						✓								
	weighted goal progr.	[70]	2003	✓			✓							✓				
		[119]	2015	✓						✓								
	fuzzy GP	[172]	2015		✓				✓		✓						✓	
	game theory approach	[120]	2016	✓											✓			
interactive	interactive / weighted sum	[229]	2014	✓							✓							
	interactive fuzzy GP	[91]	2015		✓										✓			
	interactive	[78]	2016		✓								✓			✓		
other	not specified	[96]	2012		✓								✓					
	weighted sum + comprom.	[197]	2013		✓				✓		✓							✓
	weighted sum + ϵ-constr.	[169]	2013	✓											✓			
	non-preemptive and fuzzy GP + compromise progr.	[173]	2015		✓				✓		✓						✓	
	separately	[92]	2015	✓		✓												
	EA + ϵ-constr.	[103]	2016	✓											✓	✓		
	EA + ϵ-constr.	[72]	2016	✓							✓							
	weighted sum + ϵ-constr. + WT	[284]	2016	✓						✓								
	weighted sum + ϵ-constr.	[82]	2017		✓						✓							
	EA + compromise meth.	[69]	2017	✓									✓					
	EA + weighted sum	[241]	2017	✓			✓						✓					

Table A.4: Applications of models. The third column indicates the WM or RL focus of the paper. Column four represents the studied waste type in each paper. The geographic location is given in column five. The last column indicates whether a fictional illustrative example is included. Some papers present both a case study and a fictional example. Often, it is the case that models are generic, even if they are applied to a specific waste stream. MSW = Municipal Solid Waste, ELV = End-of-Life Vehicle, LPG = Liquefied Natural Gas, WEEE = Waste of Electrical and Electronic Equipment, C&D = Construction and Demolition waste.

article	year	context	waste type	application description
Chang and Wang [174]	1995	WM	MSW	site selection in Kaohsiung City, Taiwan
Barros et al. [88]	1998	RL	sand	location model for sand recycling in The Netherlands
Antunes [287]	1999	WM	MSW	site selection in Centro Region, Portugal
Chang and Wei [188]	1999	WM	Recyclables	recycling drop-off stations and collection in Kaohsiung City, Taiwan
Krikke et al. [280]	1999	RL	copiers	copier remanufacuring in The Netherlands and Czech Republic
Chang and Wei [189]	2000	WM	MSW	site selection in Kaohsiung City, Taiwan
Krikke et al. [70]	2003	RL	refrigerators	closed-loop supply chain for refridgerators in Europe
Schultmann et al. [89]	2003	RL	batteries	battery recycling in Germany
Beamon and Fernandes [136]	2004	RL	generic	illustrative example
le Blanc et al. [259]	2004	RL	LPG tanks	recycling system for LB tanks in The Netherlands
Rakas et al. [195]	2004	WM	hazardous waste	locating undesirable facilities in Prince George's County, Maryland US
Hong et al. [218]	2006	RL	WEEE	planning e-scrap reverse production system in State of Georgia, US
Gomes Salema et al. [108]	2007	RL	office products	design of reverse logistic network for office products in Spain and Portugal
Lieckens and Vandaele [109]	2007	RL	generic	illustrative examples
Sahyouni and Savaskan [246]	2007	RL	generic	facility location study on cities in US and Europe
de Figueiredo and Mayerle [156]	2008	RL/WM	tires	design of tire recycling network in Paraná & Santa Catarina Region, Brazil
Mansour and Zarei [281]	2008	RL	ELV	illustrative examples on ELV recovery
Pati et al. [94]	2008	RL/WM	paper	paper recycling in India
Srivastava [71]	2008	RL	generic	modular product recovery in India
Gomes Salema et al. [93]	2009	RL	generic	strategic and tactical ND in Spain and Portugal
Lee and Chan [233]	2009	RL	printers/copiers	example on printer/copier recovery
Medaglia et al. [196]	2009	WM	hospital waste	disposal of hospital waste in Boyac Region, Colombia
Mitropoulos et al. [99]	2009	WM	MSW	location analysis for MSW treatment and disposal in Achaia Region, Greece
Fonseca et al. [129]	2010	RL	MSW + recyclables	location model for MSW and recyclable management in Cordoba Region, Spain
Gomes Salema et al. [157]	2010	RL	glass	design and planning of glass recycling in Portugal + illustrative examples
Kao et al. [282]	2010	WM	recyclables	location-allocation model in Hsinchu City, Taiwan
Kara and Onut [225]	2010	RL	paper	paper recycling reverse logistic network design in Istanbul City, Turkey
Pishvaee et al. [15]	2010	RL	generic	four test instances
Pishvaee and Torabi [190]	2010	RL	generic	several numerical experiments
Wang and Hsu [234]	2010	RL	generic	illustrative examples
Zarei et al. [163]	2010	RL	ELV	illustrative examples
Dai et al. [100]	2011	WM	MSW	MSW management in Beijing City, China
Gomes et al. [138]	2011	WM	WEEE	WEEE recycling network in Portugal
Mar-Ortiz et al. [122]	2011	RL	WEEE	WEEE recycling ND in Galicia Region, Spain
Pishvaee et al. [203]	2011	RL	generic	four test problems
Tuzkaya et al. [83]	2011	RL	white goods	strategic ND application for white goods in Turkey
Vidovic et al. [178]	2011	RL	ELV	positioning ELV collection points in Belgrade City, Serbia
Abdallah et al. [295]	2012	RL	generic	illustrative examples
Amin and Zhang [294]	2012	RL	computers	illustrative examples
Assavapokee and Wongthatsanekorn [139]	2012	RL	WEEE	reverse production infrastructure design in State of Texas, US
Chaabane et al. [96]	2012	RL	aluminium	illustrative examples
Chatzouridis and Komilis [288]	2012	WM	MSW	locating MSW transfer stations in East. Macedonia & Thrace Region, Greece
Dat et al. [79]	2012	RL	WEEE	illustrative examples
Hasani et al. [168]	2012	RL	food, high-tech electro	illustrative examples
Kannan et al. [289]	2012	RL	plastic	reverse logistics design for plastic in India
Lee and Lee [84]	2012	RL	bottles	forward and reverse logistics for bottles in Busan City, South Korea
Lieckens and Vandaele [223]	2012	RL	printers	example for printer recovery in US
zkr and Baslgl [302]	2012	RL	generic	illustrative examples
Pishvaee and Razmi [112]	2012	RL	medical waste	SC ND for used needles in Iran
Vahdani et al. [155]	2012	RL	steel scrap	illustrative examples
Vahdani et al. [97]	2012	RL	steel scrap	illustrative examples
Xu and Wei [200]	2012	WM	C&D waste	location-allocation of C&D waste in China
Zeballos et al. [158]	2012	RL	glass	glass collection in Portugal
Zhou et al. [242]	2012	RL	generic	illustrative examples
Amin and Zhang [197]	2013	RL	computers	illustrative examples
Amin and Zhang [169]	2013	RL	copiers	illustrative examples
Cardoso et al. [227]	2013	RL	generic	design and planning of SC in Europe
De Rosa et al. [164]	2013	RL	generic	illustrative examples
Diabat et al. [235]	2013	RL	computers	illustrative examples
Eskandarpour et al. [191]	2013	RL	WEEE	post-sales ND for electronic waste repair in Iran
Fahimnia et al. [140]	2013	RL	textile	textile recovery and impact of carbon pricing in Australia
Galan et al. [283]	2013	WM	C&D waste	facility location in Cantabria Region, Spain
Golebiewski et al. [236]	2013	RL	ELV	location of vehicle recyling facilities in Mazovia Region, Poland
Lee et al. [301]	2013	RL	generic	illustrative examples
zceylan and Paksoy [228]	2013	RL	generic	illustrative examples
zceylan and Paksoy [159]	2013	RL	generic	illustrative examples
zceylan and Paksoy [291]	2013	RL	generic	illustrative examples
zkr and Baslgl [212]	2013	RL	generic	illustrative examples
Phuc et al. [201]	2013	RL	WEEE	illustrative examples
Ramezani et al. [182]	2013	RL	generic	illustrative examples
Ramezani et al. [183]	2013	RL	generic	illustrative examples
Samanlioglu [101]	2013	WM	hazardous waste	location-routing of industrial hazardous waste in Marmara Region, Turkey
Shokohyar and Mansour [135]	2013	RL	WEEE	WEEE recycling in Iran
Song et al. [237]	2013	WM	generic	illustrative examples
Subramanian et al. [244]	2013	RL	WEEE	closed loop ND in India, illustrative examples
Vahdani et al. [205]	2013	RL	steel scrap	illustrative examples
Yao et al. [258]	2013	WM	WEEE	design and optimization of WEEE collection in Shanghai City, China
Alumur and Tari [80]	2014	RL	WEEE	collection center location in Ankara City, Turkey
Berglund and Kwon [231]	2014	WM	hazardous waste	facility location in Albany Aera, US + Joaquin County CA, US
Chen et al. [245]	2014	WM	plastics	waste plastic recycling in Tokyo Region, Japan
Demirel et al. [184]	2014	RL	generic	illustrative examples
Devika et al. [64]	2014	RL	glass	glass recovery in Iran
Faccio et al. [141]	2014	RL	electric motors	reprocessing of electric motors in Northern Italy
Hatefi and Jolai [221]	2014	RL	generic	illustrative examples

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article	year	context	waste type	application description
Jindal and Sangwan [202]	2014	RL	generic	illustrative examples
Kaya et al. [65]	2014	RL	generic	illustrative examples
Kumar et al. [266]	2014	RL	generic	illustrative examples
Litvinchev et al. [226]	2014	RL	generic	illustrative examples
Mirakhorli [229]	2014	RL	bread	closed loop ND for bread industry in Iran
Ng et al. [102]	2014	WM	MSW	waste-to-energy network synthesis in Selangor Region, Malaysia
zceylan et al. [77]	2014	RL	WEEE	illustrative examples
Pishvaee et al. [113]	2014	RL	medical waste	medical needle and syringe supply chain in Iran
Ramezani et al. [142]	2014	RL	generic	illustrative examples
Roghanian and Pazhoheshfar [238]	2014	RL	generic	illustrative examples
Sadjadi et al. [230]	2014	RL	generic	illustrative examples
Sheriff et al. [171]	2014	RL	plastic bottles	location routing in India, illustrative examples
Soleimani and Govindan [213]	2014	RL	generic	illustrative examples
Toso and Alem [165]	2014	WM	recyclables	location for sorting recyclables in Sorocaba Region, Brazil
Vahdani and Naderi-Beni [98]	2014	RL	steel scrap	illustrative examples
Zeballos et al. [143]	2014	RL	generic	illustrative examples
Accorsi et al. [85]	2015	RL	furniture	furniture recovery network in Italy
Aras et al. [118]	2015	RL	WEEE	locating recycling facility for electronic waste in Turkey
Asefi et al. [130]	2015	WM	MSW	location-routing with transfer stations in New South Wales Region, Australia
Ayvaz et al. [199]	2015	RL	WEEE	network design for WEEE in Turkey
Bing et al. [255]	2015	RL	plastic	global SC design under emission trading scheme in The Netherlands - China
Chen et al. [170]	2015	RL	toner cartridges	location-allocation and recycling decisions in Hong Kong
Chen et al. [81]	2015	RL	WEEE	supply chain design for refrigerators in Germany
Choudhary et al. [185]	2015	RL	generic	illustrative examples
Dubey et al. [87]	2015	RL	air conditioners	network design in Uttar Pradesh Region, India
Ene and ztrk [208]	2015	RL	ELV	network modelling examples and case study
Ferri et al. [114]	2015	RL/WM	MSW	reverse logistic ND in São Mateus City, Brazil
Hasani et al. [66]	2015	RL	medical devices	ND for medical devices in Teheran City, Iran
Hatefi et al. [206]	2015	RL	generic	illustrative examples
Kalaitzidou et al. [123]	2015	RL	generic	CLSC design case study for company in Europe
Kilic et al. [160]	2015	RL	WEEE	RL system design for WEEE in Turkey
Lee et al. [67]	2015	RL	bottles	reuse of bottles in Busan City, South Korea
Moghaddam [172]	2015	RL	generic	illustrative examples
Moghaddam [173]	2015	RL	generic	illustrative examples
Mota et al. [90]	2015	RL	batteries	design of battery recycling SC in Portugal
Ponce-Cueto and Molenat Muelas [292]	2015	RL	fridges	reuse network for fridges in Spain
Ramezani et al. [232]	2015	RL	generic	illustrative examples
Rezapour et al. [166]	2015	RL	automotive parts	realistic example for automotive part remanufacturing in Middle-East
Soleimani and Kannan [239]	2015	RL	hospital furniture	illustrative examples
Subulan et al. [92]	2015	RL	lead/acid batteries	ND for lead/acid battery recycling in Turkey
Subulan et al. [91]	2015	RL	tires	design of CLSC for tires in Aegean Region, Turkey
Subulan et al. [179]	2015	RL	lead/acid batteries	ND for lead/acid battery recycling in Turkey
Tokhmehchi et al. [131]	2015	RL	generic	illustrative examples
Vahdani and Mohammadi [224]	2015	RL	generic	illustrative examples
Vahdani [144]	2015	RL	steel scrap	illustrative examples
Vieira et al. [247]	2015	RL	generic	illustrative examples
Zhao and Verter [119]	2015	WM	used oil	location-routing for used oil in Chongquing Region, China
Zhou and Zhou [95]	2015	RL	paper	ND for office paper recycling in Xueyuang Road Aera, Beijing City, China
Ameknassi et al. [194]	2016	RL	generic	case study of microwave oven remanufacturing in North America and Europe
Cardoso et al. [124]	2016	RL	generic	CLSC ND study in Europe
Dai [145]	2016	RL	generic	illustrative example
Dai and Dai [209]	2016	RL	generic	illustrative example
Demirel et al. [86]	2016	RL	ELV	reverse logistics for ELV in Ankara City, Turkey
Deng et al. [261]	2016	RL	generic	illustrative example
Djikanovic and Vujosevic [146]	2016	RL	electronics	logistic model for electronics in Serbia and Europe
Entezaminia et al. [147]	2016	RL	wood and paper	production and recycling planning for wood and paper industry in Iran
Govindan et al. [78]	2016	RL	geysers	example on geyser recovery in India
Govindan et al. [103]	2016	RL	syringes	reverse ND for syringe industry in Iran
Hatefi et al. [211]	2016	RL	generic	illustrative example
Jeihoonian et al. [161]	2016	RL	durable products	illustrative example
Keyvanshokooh et al. [125]	2016	RL	generic	illustrative example
Kisomi et al. [204]	2016	RL	generic	illustrative example
Li et al. [72]	2016	RL	electronics	illustrative example
Ma et al. [193]	2016	RL	generic	illustrative example
Mirmajlesi and Shafaei [249]	2016	RL	short lifetime products	illustrative example
Mohajeri and Fallah [154]	2016	RL	notebooks	ND for notebook remanufacturing in Iran
Ozceylan [216]	2016	RL	camera	example on camera remanufacturing ND
Qiang and Zhou [222]	2016	RL	generic	example on WEEE remanufacturing
Rahmani [293]	2016	RL	generic	examples on facility location
Saranwong and Likasiri [248]	2016	RL	farm products/waste	product distribution of farm waste in Northern Thailand
Soleimani et al. [73]	2016	RL	plastic bottles	bottle recovery in India, illustrative examples
Talaei et al. [210]	2016	RL	copiers	illustrative example
Wang et al. [240]	2016	RL	generic	illustrative example
Wu and Barnes [180]	2016	RL	WEEE	WEEE recovery ND in China
Yi et al. [162]	2016	RL	construction machinery	ND for end-of-life construction machinery in China
Yu and Solvang [104]	2016	RL	general	illustrative example
Yu and Solvang [214]	2016	RL	WEEE	illustrative example
Yuchi et al. [262]	2016	RL	generic	illustrative example
Zeballos et al. [148]	2016	RL	generic	illustrative example
Zhalechian et al. [120]	2016	RL	LCD and LED TVs	TV remanufacturing in Iran, illustrative example
Zhao et al. [284]	2016	WM	hazardous waste	ND for hazardous WM in Sichuan Province, China + illustrative example
Zohal and Soleimani [74]	2016	RL	gold	CLSC ND for gold industry in Iran
Amin et al. [296]	2017	RL	tires	tire CLSC network in Ontario Region, Canada
Amin and Baki [82]	2017	RL	generic	facility location in WEEE network in Southwestern Ontario, Canada
Asgari et al. [149]	2017	WM	obnoxious waste	location-routing for hazardous materials in Singapore
Banasik et al. [106]	2017	RL	organic substrate/compost	example on industrial mushroom SC
Budak and Ustundag [286]	2017	RL	medical waste	collection and disposal for medical waste in Turkey
Chen et al. [69]	2017	RL	photovoltaic panels	illustrative example
Coelho and Mateus [297]	2017	RL	generic	illustrative example
Cui et al. [298]	2017	RL	generic	remanufacturing example in China
Dai and Li [215]	2017	RL	generic	illustrative example
Darbari et al. [126]	2017	RL	electronics	configuration of SC for electronics in New Delhi City, India
Diaz-Barriga-Fernandez et al. [132]	2017	WM	MSW, recyclables	strategic planning for MSW management in Mexico

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article	year	context	waste type	application description
Entezaminia et al. [150]	2017	RL	wood and paper	production and recycling planning for wood and paper industry in Iran
Fattahi and Govindan [167]	2017	RL	generic	illustrative example
Feito-Cespon et al. [151]	2017	RL	plastic	redesign of reverse SC for plastic in Cuba
Fu et al. [243]	2017	RL	C&D	illustrative example
Hamidieh et al. [75]	2017	RL	notebooks	SC ND for notebook repair and refurbish in Iran
Harijani et al. [121]	2017	WM	MSW, recyclables	model for recycling of MSW in Teheran, Iran
Harijani et al. [133]	2017	WM	MSW, recyclables	model for recycling of MSW in Teheran, Iran
Jeihoonian et al. [219]	2017	RL	durable products	illustrative example
Jindal and Sangwan [192]	2017	RL	generic	illustrative example
Kang et al. [68]	2017	RL	bottles	case study for beer company in a developing country
Keivanpour et al. [127]	2017	RL	EoL aircraft	illustrative example
Keshavarz Ghorabaee et al. [217]	2017	RL	home appliances	illustrative example
Li et al. [285]	2017	WM	MSW	integrated MSW management in Regina City, Canada
Mohammed et al. [152]	2017	RL	automotive parts	illustrative example
Paydar et al. [299]	2017	RL	engine oil	ND for oil recycling in Iran
Pedram et al. [220]	2017	RL	tires	tire remanufacturing in Iran
Phuc et al. [76]	2017	RL	ELV	illustrative example
Safaei et al. [300]	2017	RL	cardboard	paper recycling network in Amol City, Iran
Sampat et al. [134]	2017	WM	organic waste	livestock organic WM in Wisconsin State, USA
Sheriff et al. [260]	2017	WM	MSW, recyclables	optimization model for plastics recycling in India
Shi et al. [241]	2017	RL	generic	CL ND in 95 cities in Hunan Province, China + illustrative examples
Soleimani et al. [186]	2017	RL	generic	illustrative example
[207]	2017	RL	WEEE	ND for WEEE recycling in Turkey + illustrative example
Uster and Hwang [128]	2017	RL	generic	numerical remanufacturing study based on 263 largest cities in US
Wang et al. [181]	2017	RL	generic	illustrative example
Xu et al. [187]	2017	RL	e-waste	global SC design for recycling in Greece and China
Xu et al. [153]	2017	RL	plastic products	illustrative example
Xue et al. [290]	2017	WM	mixed	location of urban mines in China
Yu and Solvang [105]	2017	RL	general	illustrative example
Zhao and Ke [263]	2017	WM	explosive waste	location-routing for explosive waste from bauxite mining in Nanchuan City, China

Table A.5: Overview of papers handling uncertainty. The rows indicate the approach to deal with uncertainty. The parameters subject to uncertainty are listed in the columns.

approach	reference	year	demanded quantity / market size	returned quantity / waste flows / % reusability	transportation / collection cost	capacities / utilization rates	fixed opening costs	processing / operating / production costs	purchasing cost / product price	quality of returned products	delivery times / delay of product arrival	environmental impact	social impact	other
stochastic	[197]	2013	✓											
	[108]	2007	✓	✓										
	[129]	2010		✓	✓									
	[225]	2010	✓	✓										
	[158]	2012		✓						✓				
	[169]	2013	✓	✓										
	[226]	2014	✓	✓										
	[213]	2014	✓						✓					
	[143]	2014	✓	✓										
	[199]	2015		✓	✓					✓				
	[81]	2015	✓	✓						✓				
	[208]	2015		✓				✓						
	[194]	2016	✓	✓	✓	✓		✓		✓				
	[73]	2016	✓						✓					
	[214]	2016		✓					✓					
	[167]	2017	✓	✓										
	[151]	2017	✓	✓										
	[219]	2017								✓				
	[128]	2017	✓	✓										
	[105]	2017		✓								✓		
	[227]	2013	✓											
	[124]	2016	✓											
fuzzy parameters	[195]	2004		✓										
	[190]	2010	✓	✓	✓	✓	✓	✓			✓			
	[112]	2012	✓	✓	✓	✓	✓	✓						
	[155]	2012	✓	✓	✓	✓	✓							
	[200]	2012	✓		✓									
	[228]	2013	✓	✓		✓								
	[212]	2013							✓					✓
	[201]	2013	✓	✓	✓	✓	✓	✓	✓					
	[202]	2014	✓	✓	✓	✓	✓		✓					
	[65]	2014	✓	✓										
	[229]	2014	✓	✓										
	[113]	2014	✓	✓	✓	✓	✓	✓				✓	✓	
	[142]	2014	✓	✓	✓	✓	✓	✓			✓			
	[230]	2014		✓										
	[172]	2015	✓	✓		✓								
	[145]	2016				✓	✓							
	[209]	2016				✓		✓						
	[103]	2016	✓			✓	✓	✓						✓
	[249]	2016	✓											
	[216]	2016	✓			✓								
	[82]	2017	✓											
	[215]	2017	✓			✓			✓					
	[75]	2017	✓		✓		✓	✓						
	[192]	2017	✓			✓	✓	✓						✓
	[68]	2017		✓										✓
	[217]	2017	✓			✓								
	[220]	2017	✓	✓						✓				
	[76]	2017	✓	✓	✓	✓	✓	✓	✓					✓
interval	[100]	2011		✓	✓	✓		✓						✓
robust	[218]	2006		✓		✓								✓
	[203]	2011	✓	✓	✓									
	[168]	2012	✓						✓					
	[97]	2012			✓	✓	✓							✓
	[164]	2013	✓	✓										
	[183]	2013	✓	✓										
	[231]	2014	✓											✓
	[221]	2014	✓	✓						✓				
	[118]	2015		✓										
	[87]	2015	✓	✓										
	[232]	2015	✓	✓										
	[211]	2016	✓	✓		✓	✓							
	[204]	2016	✓		✓			✓						
	[222]	2016	✓	✓						✓				
	[150]	2017	✓				✓	✓						
	[299]	2017		✓										
	[300]	2017	✓											
other / combinations	[295]	2012	✓											
	[223]	2012									✓			
	[236]	2013		✓										
	[135]	2013		✓										
	[205]	2013	✓	✓	✓	✓	✓	✓						✓
	[238]	2014	✓											
	[165]	2014	✓		✓	✓								
	[98]	2014	✓	✓		✓								
	[66]	2015	✓	✓					✓					
	[206]	2015	✓	✓	✓	✓	✓	✓						
	[92]	2015	✓	✓	✓	✓	✓							✓
	[224]	2015	✓	✓							✓			
	[144]	2015	✓	✓	✓	✓	✓	✓			✓			
	[125]	2016	✓	✓										
	[193]	2016	✓	✓	✓			✓						
	[154]	2016	✓	✓										
	[210]	2016	✓					✓						
	[120]	2016	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓
	[296]	2017	✓	✓										
	[298]	2017	✓	✓										
	[152]	2017	✓	✓								✓		
	[207]	2017		✓	✓		✓	✓						✓
	[187]	2017		✓	✓									✓

Table A.6: Solution methods of reviewed models. Columns three, four and five indicate whether the model incorporates uncertainty, multiple objectives and non-linearities. When a model is linearized before solving, this is indicated by "(lin)" in column five. Column six indicates if a model is solved exactly (exact), heuristically (heur.), by a combination of both (exact + heur., e.g. global heuristic for first stage location decisions combined with an exact procedure in for allocation in a second stage) or in two separate ways (exact / heur., often to compare exact to heuristic solutions). The last column provides information about the applied heuristic, if it is specified. unc. = model incorporates uncertainty; MO = multi objective model; NL = non-linear model; GA = Genetic Algorithm; PSO = Particle Swarm Optimization; AIS = Artificial Immune System; VNS = Variable Neighborhood Search; SA = Simulated Annealing; AC = Ant Colony; ICA = Imperialist Competitive Algorithm; (A)BD = (Accelerated) Benders Decomposition; MA = Memetic Algorithm, combining GA and local search; SAA = Sample Average Approximation; VI = Variational Inequality; ABC = Artificial Bee Colony.

article	year	unc.	MO	NL	exact / heuristic	solver / solution technique
Chang and Wang [174]	1995				exact	LINDO
Barros et al. [88]	1998				heur.	GAMS
Antunes [287]	1999				exact	XPRESS-MP
Chang and Wei [188]	1999		✓	✓	heur.	GA
Krikke et al. [280]	1999				exact	LINDO
Chang and Wei [189]	2000		✓	✓	heur.	GA
Krikke et al. [70]	2003		✓		exact	CPLEX
Schultmann et al. [89]	2003				exact	GAMS
Beamon and Fernandes [136]	2004				unclear	
le Blanc et al. [259]	2004				exact + heur.	AIMMS with CPLEX + nearest neighbor and local search techniques
Rakas et al. [195]	2004	✓	✓		exact	CPLEX
Hong et al. [218]	2006	✓			exact + heur.	CPLEX + heuristic as described in [303]
Gomes Salema et al. [108]	2007	✓			exact	GAMS + CPLEX
Lieckens and Vandaele [109]	2007			✓	heur.	GA
Sahyouni and Savaskan [246]	2007				exact / heur.	CPLEX / lagrangian relaxation
de Figueiredo and Mayerle [156]	2008			✓	heur.	modified Teitz and Bart procedure coupled with Fibonacci and bisection search methods
Mansour and Zarei [281]	2008				heur.	multiple start search algorithm
Pati et al. [94]	2008		✓		exact	LINDO
Srivastava [71]	2008				exact	GAMS + CPLEX
Gomes Salema et al. [93]	2009				exact	GAMS + CPLEX
Lee and Chan [233]	2009			✓	heur.	GA
Medaglia et al. [196]	2009		✓		exact + heur.	XPRESS-MP + GA
Mitropoulos et al. [99]	2009				exact	Premium solver + XPRESS
Fonseca et al. [129]	2010	✓			exact	CPLEX
Gomes Salema et al. [157]	2010				exact	GAMS + CPLEX
Kao et al. [282]	2010				exact	CPLEX
Kara and Onut [225]	2010	✓			exact	GAMS + CPLEX
Pishvaee et al. [15]	2010		✓	✓(lin)	exact / heur.	LINGO / GA
Pishvaee and Torabi [190]	2010	✓	✓		exact	LINGO
Wang and Hsu [234]	2010				exact / heur.	LINGO, CPLEX / GA
Zarei et al. [163]	2010				exact / heur.	LINGO / GA
Dai et al. [100]	2011	✓			unclear	
Gomes et al. [138]	2011				exact	GAMS + CPLEX
Mar-Ortiz et al. [122]	2011				exact +/ heur.	CPLEX +/ savings-based heuristic
Pishvaee et al. [203]	2011	✓			exact	CPLEX
Tuzkaya et al. [83]	2011		✓	✓	heur.	GA
Vidovic et al. [178]	2011				exact	LPSolve IDE
Abdallah et al. [295]	2012	✓		✓	exact	GAMS
Amin and Zhang [294]	2012				exact	GAMS
Assavapokee and Wongthatsanekorn [139]	2012				exact	GAMS + CPLEX
Chaabane et al. [96]	2012		✓		exact	LINGO
Chatzouridis and Komilis [288]	2012			✓(lin)	exact	Excel + LINDO add-on
Dat et al. [79]	2012				exact	AMPL + CPLEX
Hasani et al. [168]	2012	✓			exact	LINGO
Kannan et al. [289]	2012				exact	LINGO
Lee and Lee [84]	2012			✓	exact / heur.	LINGO / GA
Lieckens and Vandaele [223]	2012	✓		✓	heur.	GA
zkr and Baslgl [302]	2012				exact	GAMS
Pishvaee and Razmi [112]	2012	✓	✓		exact	LINDO
Vahdani et al. [155]	2012	✓		✓	exact	GAMS
Vahdani et al. [97]	2012	✓	✓		exact	GAMS
Xu and Wei [200]	2012	✓			heur.	PSO-based heuristic
Zeballos et al. [158]	2012	✓			exact	GAMS + CPLEX
Zhou et al. [242]	2012				heur.	PSO
Amin and Zhang [197]	2013	✓	✓	✓	exact	GAMS
Amin and Zhang [169]	2013	✓	✓		exact	CPLEX
Cardoso et al. [227]	2013	✓			exact	GAMS + CPLEX
De Rosa et al. [164]	2013	✓			exact	IBM ILOG CPLEX Optimization Studio
Diabat et al. [235]	2013			✓	heur.	GA / AIS
Eskandarpour et al. [191]	2013		✓	✓(lin)	exact / heur.	LINGO, Gurobi / VNS
Fahimnia et al. [140]	2013				exact	AMPL + CPLEX
Galan et al. [283]	2013				exact	GAMS
Golebiewski et al. [236]	2013	✓		✓	heur.	GA
Lee et al. [301]	2013			✓	exact	GAMS
zceylan and Paksoy [159]	2013				exact	GAMS + CPLEX
zceylan and Paksoy [228]	2013	✓	✓		exact	GAMS + CPLEX
zceylan and Paksoy [291]	2013			✓	exact	GAMS + BARON
zkr and Baslgl [212]	2013	✓	✓		exact	GAMS + BARON
Phuc et al. [201]	2013	✓			exact	MATLAB
Ramezani et al. [182]	2013		✓		unclear	
Ramezani et al. [183]	2013	✓			exact	GAMS + CPLEX
Samanlioglu [101]	2013		✓		exact	CPLEX
Shokohyar and Mansour [135]	2013	✓	✓		heur.	Simulation Based Optimization
Song et al. [237]	2013			✓	exact / heur.	CPLEX / GA
Subramanian et al. [244]	2013				exact / heur.	CPLEX / Priority based SA
Vahdani et al. [205]	2013	✓	✓		exact	GAMS
Yao et al. [258]	2013				exact /+ heur.	LINGO / AC algorithm
Alumur and Tari [80]	2014		✓	✓(lin)	exact	CPLEX

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article	year	unc.	MO	NL	exact / heuristic	solver / solution technique
Berglund and Kwon [231]	2014	✓		✓(lin)	exact / heur.	CPLEX / GA
Chen et al. [245]	2014			✓	heur.	VNS
Demirel et al. [184]	2014	✓	✓		exact /+ heur.	GAMS + CPLEX /+ GA
Devika et al. [64]	2014				exact / heur.	GAMS / based on VNS and ICA
Faccio et al. [141]	2014				exact	GAMS
Hatefi and Jolai [221]	2014	✓			exact	GAMS + CPLEX
Jindal and Sangwan [202]	2014	✓			exact	LINGO
Kaya et al. [65]	2014	✓			exact	GAMS + CPLEX
Kumar et al. [266]	2014				exact	CPLEX
Litvinchev et al. [226]	2014	✓		✓	exact / heur.	GAMS + DICOPT, CPLEX / Golden Selection Search
Mirakhorli [229]	2014	✓	✓		exact / heur.	LINGO / GA
Ng et al. [102]	2014		✓		exact	GAMS + BARON
zceylan et al. [77]	2014			✓	exact	GAMS + COIN/BONMIN
Pishvaee et al. [113]	2014	✓	✓	✓(lin)	exact	GAMS + CONOPT + CPLEX, ABD
Ramezani et al. [142]	2014	✓	✓		exact	GAMS + CPLEX
Roghanian and Pazhoheshfar [238]	2014	✓			heur.	GA
Sadjadi et al. [230]	2014	✓		✓(lin)	exact / heur.	LINGO / MA
Sheriff et al. [171]	2014			✓	exact	LINGO
Soleimani and Govindan [213]	2014	✓			exact	CPLEX
Toso and Alem [165]	2014	✓			exact	GAMS + CPLEX
Vahdani and Naderi-Beni [98]	2014	✓			not specified	
Zeballos et al. [143]	2014	✓			exact	GAMS + CPLEX
Accorsi et al. [85]	2015				exact	AMPL + Gurobi
Aras et al. [118]	2015	✓			exact	GAMS + CPLEX
Asefi et al. [130]	2015				exact	GAMS + CPLEX
Ayvaz et al. [199]	2015	✓			exact + heur.	CPLEX + SAA
Bing et al. [255]	2015				exact	XPRESS
Chen et al. [170]	2015				exact / heur.	LINGO / GA
Chen et al. [81]	2015	✓		✓	exact	CPLEX + integer L-shaped method + SAA
Choudhary et al. [185]	2015				heur.	forest data structure algorithm
Dubey et al. [87]	2015	✓	✓	✓(lin.)	exact + heur.	CPLEX + AC algorithm
Ene and ztrk [208]	2015	✓			exact	Gurobi
Ferri et al. [114]	2015				exact	CPLEX
Hasani et al. [66]	2015	✓		✓	exact +/ heur.	GAMS + LINDOGLOBAL +/ MA (GA + adaptive VNS)
Hatefi et al. [206]	2015	✓			exact	GAMS + CPLEX
Kalaitzidou et al. [123]	2015				exact	GAMS + CPLEX
Kilic et al. [160]	2015				exact	GAMS
Lee et al. [67]	2015		✓		exact / heur.	LINGO / GA
Moghaddam [172]	2015	✓	✓		exact	LINGO
Moghaddam [173]	2015		✓		exact	LINGO
Mota et al. [90]	2015		✓		exact	GAMS + CPLEX
Ponce-Cueto and Molenat Muelas [292]	2015				exact	AIMMS + CPLEX
Ramezani et al. [232]	2015	✓	✓		exact + heur.	GAMS + CPLEX + scenario relaxation algorithm
Rezapour et al. [166]	2015			✓	exact + heur.	unspecified solver + VI, modified projection algorithm
Soleimani and Kannan [239]	2015				exact / heur.	CPLEX / combination of PSO and GA
Subulan et al. [91]	2015	✓	✓		exact	ILOG CPLEX OPL Studio
Subulan et al. [92]	2015	✓	✓		exact	GAMS + CPLEX
Subulan et al. [179]	2015		✓		exact	ILOG CPLEX OPL Studio
Tokhmehchi et al. [131]	2015				heur.	GA + Firefly Algorithm
Vahdani and Mohammadi [224]	2015	✓	✓	✓	exact / heur.	GAMS / self-adaptive ICA
Vahdani [144]	2015	✓	✓		exact	GAMS
Vieira et al. [247]	2015			✓	exact / heur.	GAMS + CPLEX / AC optimization
Zhao and Verter [119]	2015		✓		exact	CPLEX
Zhou and Zhou [95]	2015			✓	exact	LINGO
Ameknassi et al. [194]	2016	✓	✓	✓(lin.)	exact	GAMS + CPLEX
Cardoso et al. [124]	2016	✓	✓		exact	GAMS + CPLEX
Dai [145]	2016	✓	✓		exact	CPLEX
Dai and Dai [209]	2016	✓	✓		exact	CPLEX
Demirel et al. [86]	2016				exact	GAMS + CPLEX
Deng et al. [261]	2016			✓	heur.	hybrid AC optimization, based on AC and ABC
Djikanovic and Vujosevic [146]	2016				exact	CPLEX
Entezaminia et al. [147]	2016		✓		exact	CPLEX
Govindan et al. [78]	2016		✓		exact	LINGO
Govindan et al. [103]	2016	✓	✓		exact / heur.	LINGO / PSO
Hatefi et al. [211]	2016	✓			exact	GAMS + CPLEX
Jeihoonian et al. [161]	2016				exact	CPLEX, BD with local branching and Pareto optimality cut
Keyvanshokooh et al. [125]	2016	✓			exact	GAMS + CPLEX, ABD
Kisomi et al. [204]	2016	✓			exact	GAMS + CPLEX
Li et al. [72]	2016		✓		exact / heur.	CPLEX / GA with and without local search
Ma et al. [193]	2016	✓	✓	✓(lin.)	exact	LINGO
Mirmajlesi and Shafaei [249]	2016	✓		✓(lin.)	exact / heur.	GAMS + CPLEX / Differential Evolution and Tabu Search
Mohajeri and Fallah [154]	2016	✓			exact	GAMS
Ozceylan [216]	2016	✓			exact	GAMS
Qiang and Zhou [222]	2016	✓			exact	LINGO
Rahmani [293]	2016			✓	exact	based on Mixed Integer Non-Linear Branch-and-Bound algorithm
Saranwong and Likasiri [248]	2016			✓	exact / heur.	CPLEX / Layer Iterative Method
Soleimani et al. [73]	2016	✓			exact	CPLEX
Talaei et al. [210]	2016	✓	✓		not specified	
Wang et al. [240]	2016				exact / heur.	CPLEX / Cross-Entropy, new hybrid of Cross-Entropy and GA, GA
Wu and Barnes [180]	2016		✓		heur.	AIS
Yi et al. [162]	2016				exact / heur.	LINGO / GA
Yu and Solvang [104]	2016		✓		exact	LINGO
Yu and Solvang [214]	2016	✓	✓		exact	LINGO
Yuchi et al. [262]	2016			✓	heur.	Tabu Search
Zeballos et al. [148]	2016				exact	GAMS + CPLEX
Zhalechian et al. [120]	2016	✓	✓	✓	exact / heur.	GAMS + BARON / GA + VNS
Zhao et al. [284]	2016		✓		exact	CPLEX
Zohal and Soleimani [74]	2016		✓		exact / heur.	LINGO / AC optimization
Amin et al. [296]	2017	✓			exact	GAMS
Amin and Baki [82]	2017	✓	✓		exact	GAMS
Asgari et al. [149]	2017		✓	✓	heur.	GA + Tabu Search
Banasik et al. [106]	2017		✓		exact	XPRESS-IVE
Budak and Ustundag [286]	2017				exact	XPRESS-IVE

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article	year	unc.	MO	NL	exact / heuristic	solver / solution technique
Chen et al. [69]	2017		✓		exact / heur.	CPLEX / PSO
Coelho and Mateus [297]	2017				exact / heur.	CPLEX, BD in AMPL
Cui et al. [298]	2017	✓		✓	heur.	ABC algorithm
Dai and Li [215]	2017	✓	✓		exact	CPLEX
Darbari et al. [126]	2017		✓		exact	LINGO
Diaz-Barriga-Fernandez et al. [132]	2017		✓	✓(lin.)	exact	GAMS + BARON
Entezaminia et al. [150]	2017	✓		✓(lin.)	exact	CPLEX
Fattahi and Govindan [167]	2017	✓			exact / heur.	GAMS + CPLEX / simulation based SA
Feito-Cespon et al. [151]	2017	✓	✓	✓	exact	MATLAB + SCIP
Fu et al. [243]	2017		✓		heuristic	PSO
Hamidieh et al. [75]	2017	✓	✓	✓(lin.)	unclear	
Harijani et al. [121]	2017		✓		exact	CPLEX
Harijani et al. [133]	2017				exact	CPLEX
Jeihoonian et al. [219]	2017				exact	CPLEX, based on L-shaped algorithm
Jindal and Sangwan [192]	2017	✓	✓		exact	LINGO
Kang et al. [68]	2017	✓			heur.	PSO, AIS
Keivanpour et al. [127]	2017	✓	✓	✓	heur.	GA
Li et al. [285]	2017			✓	heur.	iterative algorithm
Mohammed et al. [152]	2017	✓			exact	GAMS + CPLEX
Paydar et al. [299]	2017	✓	✓		exact	LINGO
Pedram et al. [220]	2017	✓			exact	GAMS + CPLEX
Phuc et al. [76] ‘	2017	✓			unclear	
Safaei et al. [300]	2017	✓			exact	LINGO
Sampat et al. [134]	2017		✓		exact	Gurobi
Sheriff et al. [260]	2017			✓	exact	LINGO
Shi et al. [241]	2017		✓		heur.	GA
Soleimani et al. [186]	2017		✓		exact / heur.	LINGO / GA
Temur and Yanik [207]	2017	✓			exact / heur	GAMS + CPLEX / Cloud Based Design Optimization (CBDO)
Uster and Hwang [128]	2017	✓			exact	CPLEX, enhanced BD
Wang et al. [181]	2017			✓	heur.	Plant Growth Simulation Algorithm
Xu et al. [187]	2017	✓			exact	GAMS + CPLEX
Xu et al. [153]	2017				exact	IBM ILOG CPLEX Optimization Studio
Xue et al. [290]	2017				exact	GIS
Yu and Solvang [105]	2017	✓			exact	LINGO
Zhao and Ke [263]	2017		✓		exact	CPLEX

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