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Weighted Goal Programming	.1LINDO
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NTIC

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.1
.2
.3

Atlas chimie

7

8

: -2-1

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: -3-1

: 9

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-2

méthodes d'agrégation multicritère

(1998) Carlos Romero & Mehrdad Tamiz

10

11

12

$$\begin{array}{lll}
 \delta_i^+ & f_i(x) - \delta_i^+ + \delta_i^- = b_i & f_i(x) \leq b_i \\
 \delta_i^- & f_i(x) - \delta_i^+ + \delta_i^- = b_i & f_i(x) \geq b_i \\
 \delta_i^+ + \delta_i^- & f_i(x) - \delta_i^+ + \delta_i^- = b_i & f_i(x) = b_i
 \end{array}$$

(Standard Goal

Programming)

13

$$\left\{ \begin{array}{l}
 \min(Z) = \sum_{i=1}^p (\delta_i^+ + \delta_i^-) \\
 \text{subject to} \left\{ \begin{array}{l}
 \sum a_{ij} x_j - \delta_i^+ + \delta_i^- = b_i \\
 c x \leq c \\
 x_j \leq 0 \quad (j=1,2,3\dots n) \\
 \delta_i^+ \text{ et } \delta_i^- \geq 0 \quad (i=1,2,3\dots p)
 \end{array} \right.
 \end{array} \right.$$

$$\delta_i^+ \quad \delta_i^- \quad (\delta_i^+ \times \delta_i^-)$$

:

a_{ij}

B

C

i

b_i

δ_i^+

i

b_i

δ_i^-

15

$$\begin{cases}
 \min(Z) = \sum_{i=1}^p \left(w_i^+ \delta_i^+ + w_i^- \delta_i^- \right) \\
 \text{subject to} \begin{cases}
 \sum a_{ij} x_j - \delta_i^+ + \delta_i^- = b_i \\
 c x \leq c \\
 x_j \leq 0 \quad (j = 1, 2, 3 \dots n) \\
 \delta_i^+ \text{ et } \delta_i^- \geq 0 \quad (i = 1, 2, 3 \dots p)
 \end{cases}
 \end{cases}$$

$(w_j^+ = w_j^- = 1)$

$$\begin{matrix}
 \cdot \delta_i^- & : w_i^- \\
 \cdot \delta_i^+ & : w_i^+ \\
 \cdot i & w_i
 \end{matrix}$$

¹⁶Martel et Aouni.B

Atlas chimie

-3

17

: -1-3

%60 -50

380290500

29048975

$$w_1^+ = 2, w_2^- = 1 \quad . \quad 1 \quad 2 : \quad (w_i)$$

685106.38 -

11030000 -
4051280 -

(1)

(2)

: X3 .

: X2 .

: X1

. i = (1.2. 3 .. 6) Ei

$$\begin{array}{l}
 \text{WGP} \left\{ \begin{array}{l}
 \text{min}(Z) = 2\delta_1^+ + \delta_2^- \\
 \text{subject to} \left\{ \begin{array}{l}
 77.44x_1 + 71.21x_2 + 97.83x_3 + \delta_1^- - \delta_1^+ = 367744220 \\
 2.55x_1 + 3179x_2 + 7.17x_3 + \delta_2^- - \delta_2^+ = 41595255 \\
 0.127x_1 + 0.002x_2 + 0.005x_3 \leq 2000000 \\
 0.027x_1 + 0.006x_3 \leq 500000 \quad ; \quad 0.0009x_1 \leq 5000 \\
 0.0001x_2 \leq 20000 \quad ; \quad 0.002x_2 \leq 50000 \\
 0.002x_3 \leq 5000 \quad ; \quad x_1 \leq 11030000 \\
 x_2 \leq 68510638 \quad ; \quad x_3 \leq 4051280 \\
 x_1, x_2, x_3 \geq 0 ; \delta_1^-, \delta_2^-, \delta_1^+, \delta_2^+ \geq 0
 \end{array} \right.
 \end{array} \right.
 \end{array}$$

:

δ_1^+ -
 δ_2^- -

Lindo 6.1

(3)

(3)

:

29048975
 741460.812 : 380290500
 2500000 685106.375

(4)

%92.24

"compromis"

(Slack Variables)

(E2) : _____ (كغ 1891964.25) (E1) : _____ -
 : _____ (كغ 4332.68) (E3) : _____ (كغ 464980.56)
 (كغ 48629.78) (E5) : _____ (كغ 19931.49) (E4)
 .(كغ 0) (E6) : _____ -

(0) (1370.21) (68.51) (667.32) (35019.44) (108035.75)

$$\Delta_1 = 10288539 ; \Delta_2 = 0 ; \Delta_3 = 1551280.13$$

(Dual Price) (5)

(Shadow Price)

: -4-3

: -1-4-3

$$\alpha \in]16964086, +\infty[: \\ 16964086$$

$$\alpha \neq 0 \quad \alpha$$

$$\alpha$$

$$\alpha \in]1890725, 558605.63[: \\ 1890725$$

$$\alpha$$

558605.63

: -2-4-3

$$\alpha$$

$$\alpha$$

:

$$\alpha \in]1891964.25, +\infty[$$

:(5)

$$\alpha \in]-464980.56, +\infty[: \\ \alpha$$

$$\alpha \in]-4332.68, +\infty[: \\ \alpha$$

$$\alpha \in]-19931.49, +\infty[: \\ \alpha$$

$$\alpha \in]-48629.78, +\infty[: \\ \alpha$$

$$\alpha \in]-282.93, 527.39[: \\ \alpha$$

:

:

$\alpha \in]-1551280.13, +\infty[$, $\alpha \in]18971.06, 59475.47[$, $\alpha \in]-10288539, +\infty[$

: (1)

()	()	()	
2.55	80	77.44	
31.79	103	71.21	
7.17	105	97.83	

:

: (2)

()				
2000000	0.005	0.002	0.127	
500000	0.006	-	0.027	
5000	-	-	0.0009	
20000	-	0.0001	-	
50000	-	0.002	-	
5000	0.002	-	-	

:

: (3)

Z = 0	P ₂ =0 ; P ₁ =0 N ₁ =16964086 N ₂ =0	X ₁ =741460.812 X ₂ =685106.37 X ₃ =2500000
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LINDO 6.1 :

: (4)

()	()	() X ₃	() X ₂	() X ₁	
29048975	380290500	4051280	685106.38	11030000	
29048976.5	350780149	2500000	685106.375	741460.8	
+1.5423	-29510351	-1551280	-0.05	-10288539.2	Δ

: (5)

LP OPTIMUM FOUND AT STEP 3

RANGES IN WHICH THE BASIS IS UNCHANGED:

OBJECTIVE FUNCTION VALUE

1)	0.0000000E+00	
VARIABLE	VALUE	REDUCED COST
P1	0.000000	2.000000
N2	0.000000	1.000000
X1	741460.812500	0.000000
X2	685106.375000	0.000000
X3	2500000.000000	0.000000
N1	16964086.000000	0.000000
P2	0.000000	0.000000

VARIABLE	CURRENT COEF	OBJ COEFFICIENT RANGES	
		ALLOWABLE INCREASE	ALLOWABLE DECREASE
P1	2.000000	INFINITY	2.000000
N2	1.000000	INFINITY	1.000000
X1	0.000000	2.550000	0.000000
X2	0.000000	0.000000	INFINITY
X3	0.000000	0.000000	INFINITY
N1	0.000000	0.000000	0.032929
P2	0.000000	INFINITY	0.000000

ROW	SLACK OR SURPLUS	DUAL PRICES
2)	0.000000	0.000000
3)	0.000000	0.000000
4)	1891964.250000	0.000000
5)	464980.562500	0.000000
6)	4332.685059	0.000000
7)	19931.490234	0.000000
8)	48629.789062	0.000000
9)	0.000000	0.000000
10)	10288539.000000	0.000000
11)	0.000000	0.000000
12)	1551280.125000	0.000000

ROW	CURRENT RHS	ALLOWABLE INCREASE	ALLOWABLE DECREASE
2367744224	0.000000	INFINITY	16964086.000000
3	41595256.000000	558605.625000	1890725.000000
4	2000000.000000	INFINITY	1891964.250000
5	500000.000000	INFINITY	464980.562500
6	5000.000000	INFINITY	4332.685059
7	20000.000000	INFINITY	19931.490234
8	50000.000000	INFINITY	48629.789062
9	5000.000000	527.398926	282.939758
10	11030000.000000	INFINITY	10288539.000000
11	685106.375000	59475.468750	18971.058594
12	4051280.000000	INFINITY	1551280.125000

NO. ITERATIONS= 3

المصدر : مخرجات البرنامج LINDO 6.1

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⁵- Y. Pimor ,Op-Cit , P 05.

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%20 SAREL Agro-industrie