

INSTITUTIONAL AND INDUSTRIAL SYMBIOSIS CASE STUDY OF COOPERATION FOR DEVELOPMENT IN FORESTRY AND WOOD-BASED SECTOR

Władysław Kusiak, Elżbieta Mikołajczak, Leszek Wanat

Poznań University of Life Sciences, Collegium Da Vinci in Poznań
Poland

Industrial symbiosis?

- It is possible?
- How is this possible?
- Industrial symbiosis idea - transfer natural models to the anthropogenic world
- In the theory of industrial ecology, companies imitate nature this way: within it, nothing is waste, and every element is constantly processed and managed.
- Is this a new theory?

Is this a new theory?

- No, this theory is as old as the world!
- How is it? It's nature ...
- **But ... in economics ...**
- The theory, methodologies, and case studies in the field of industrial symbiosis have been developing **for nearly 30 years...**
- **A review of industrial symbiosis research: theory and methodology**, by Zhang, Y., Zheng, H., Chen, B. et al., Frontiers of Earth Science, (2015) 9: 91. <https://doi.org/10.1007/s11707-014-0445-8>.
- Maybe you need to research it?

Why especially in the forest and wood-based sector?

- The competitiveness of the forest-and wood based sector [continues] to be determined by the strong conflict between its productive, recreational and protective functions.
- The concept of "sustainable development" stems directly from forestry management.... You know....

Sylvicultura Oeconomica

- Hans Carl von Carlowitz defined the concept of economic activity in forestry...
- **Sylvicultura Oeconomica** oder Anweisung zur wilden Baum-Zucht (Sylvicultura Oeconomica or the Instructions for Wild Tree Cultivation)
- in the 18th century (**1713**);



So many basics, introductions...

Time for a case study... **Objectives:**

- Question about: the possibility of cooperation (industrial symbiosis) of various partners in the forest and wood-based sector (and they have conflicting business interests)...
- What factors can create the symbiosis and cooperation of actors?

A new competitive model?

- A starting point for local development programming **should be seeking new dynamic factors**, which are not limited to local resources, but rather are related to intermunicipal and intersectoral **cooperation**.
- A development policy based only on competition **is no longer sufficient** and often leads to opposite effects to those intended.

Material and methods (in short)

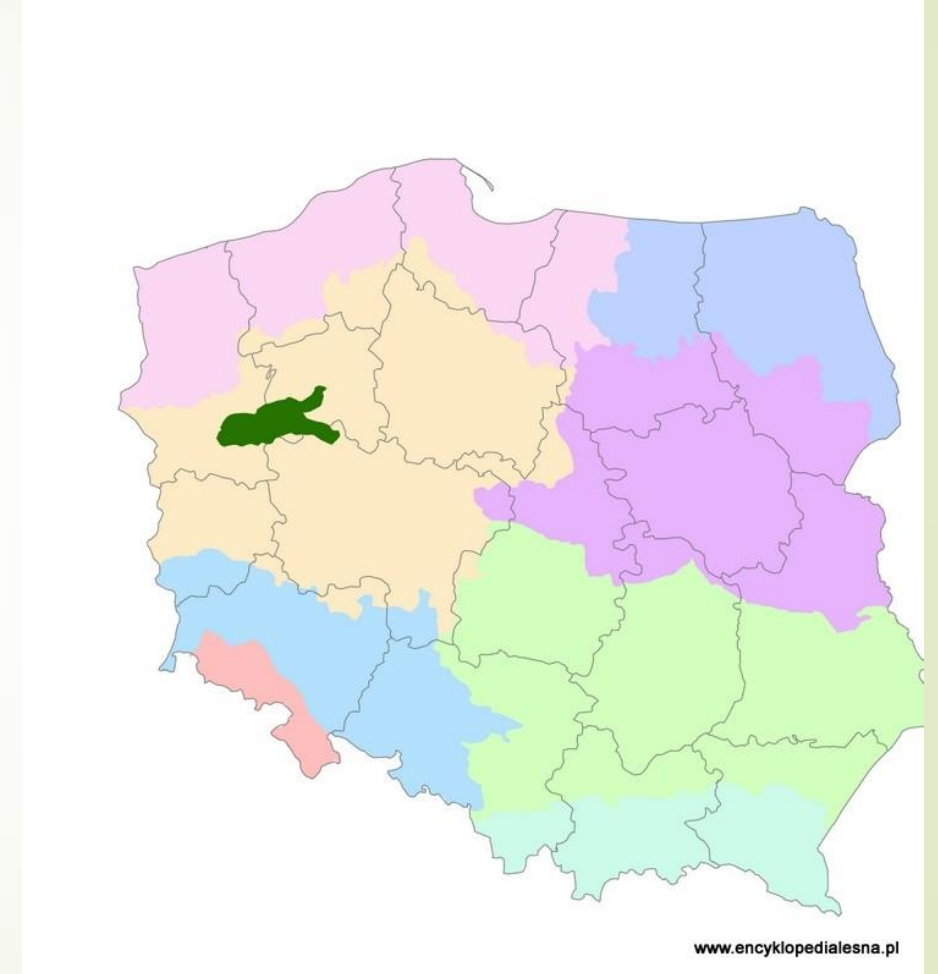
- diagnostic survey of **two partnerships** in forest areas - the case of Poland - a few words about them in a moment...
- about 550 respondents, from four main groups (municipalities, business /especially from the forestry and wood-based sector/, NGO's, inhabitants /towns and villages/)
- research period, finally, two years (2016-2017)
- above all, qualitative analysis, but
- of course, also quantitative tools:
- identification of main factors (descriptive statistics methods, multivariable analysis, regression) and agglomeration methods (i.a. Ward method)...

Case 1: Puszcza Notecka (Notecka Forests)



Międzychód: main municipality in the 1. partnership

Notecka Forests Microregion

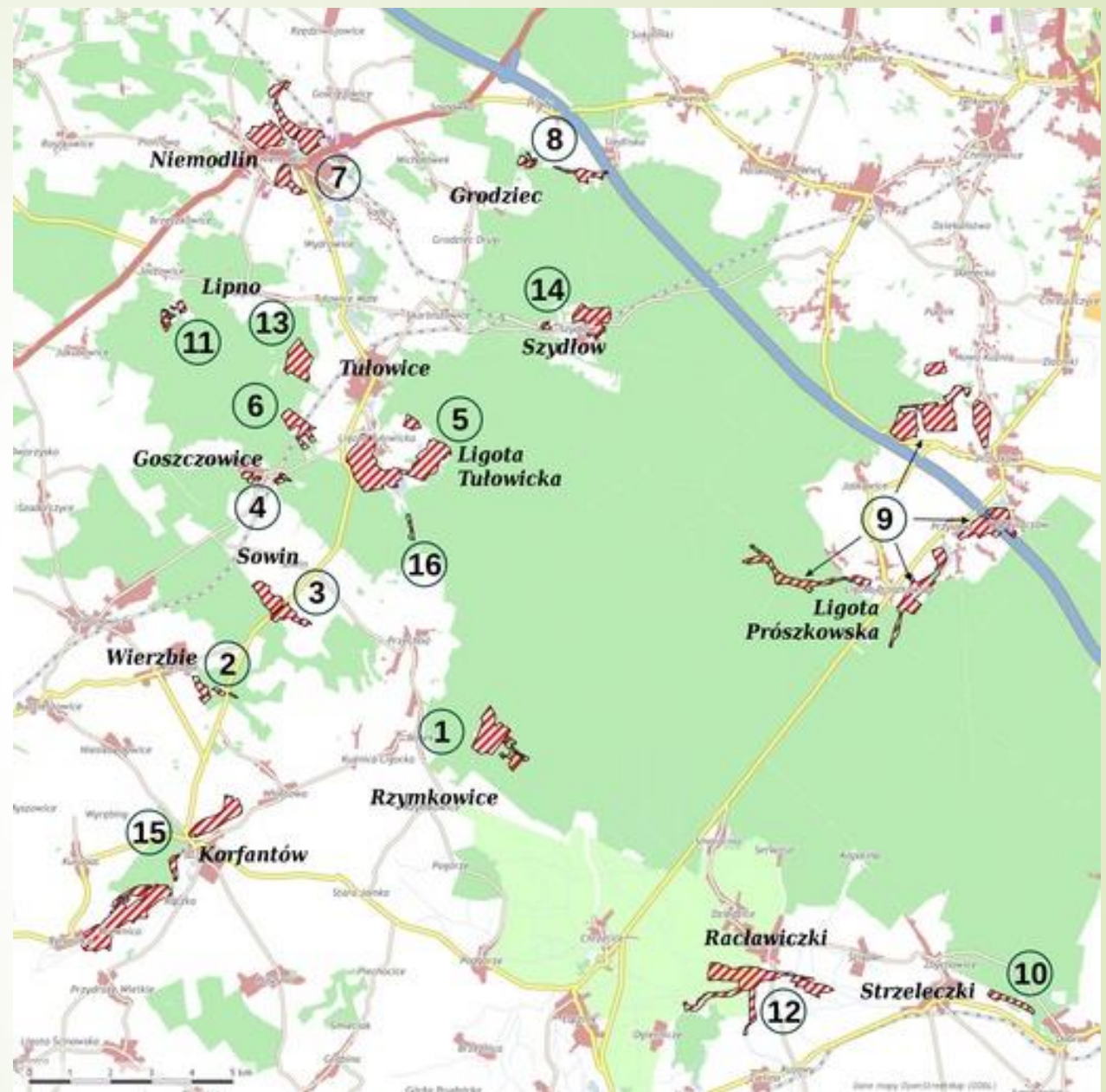


Puszcza Notecka (Notecka Forests):

- area of 1 400 square kilometers (homogeneous forest);
- In the Wielkopolska region, north of Poznań;
- between two rivers: Warta and Noteć
- only forest - 100 km long, 20 km wide;
- you can go all day - and not meet any people
- problems: poverty, poor economic development
- 10 municipalities;
- near cities - woodworking factories (industry)

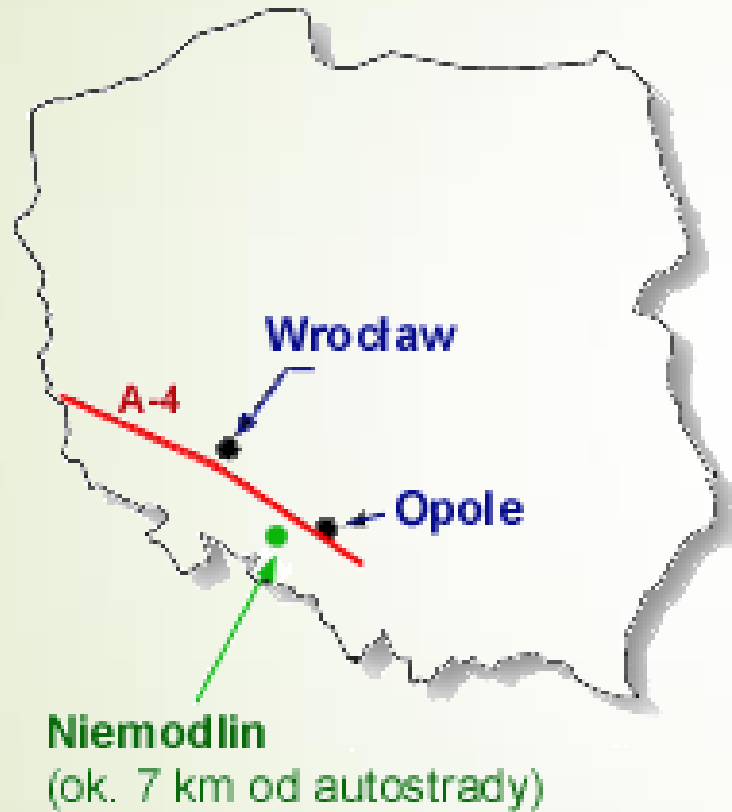
Case 2: Bory Niemodlińskie

- area of 500 square kilometers (homogeneous forest);
- the Śląsk (Silesian) region of Opole, south of Opole and the Odra river;
- problems (the same): poverty, poor economic development
- multinational structure (Polish people, Silesians, Germans, repatriates...)
- 7 municipalities;
- 16 cooperation incubators
- small industry.



Niemodlin: main municipality in the 2. partnership

Niemodlin Forests Microregion



Bory Niemodlińskie (Niemodlin Forests)



Forest district Tułowice

Natur reserve: Jaśkowice



Bory Niemodlińskie: lakes in forest areas



Results

- Which main factors determine the success of cooperation (symbiosis) in both cases of partnerships?

Table 1. Diversification of the impact of cooperation factors of the studied partnerships

INTEGRAL MODEL OF COOPERATION		Identification of the power of factors influencing the effectiveness of the partnership	
AIMS Strategic Management		Niemodlin Forests	Notecka Forests
I.	Composition of the partnership	Very Strong (I)	String (II)
II.	Potential for partnership	String (II)	Very Strong (I)
III.	Functional network	Very Strong (I)	Average (III)
IV.	Development programming	Average (III)	Very Strong (I)
V.	Strategic Integration	String (II)	String (II)
VI.	Integration of services and infrastructure	String (II)	Average (III)
VII.	Monitoring and evaluation	Average (III)	Average (III)
RELATIONS Operational Management		Niemodlin Forests	Notecka Forest
VIII.	Public relations	Average (III)	Average (III)
IX.	Internal communication	String (II)	String (II)
X.	Trust	Very Strong (I)	Very Strong (I)

What determines the quality of symbiosis (cooperation)?

- **Composition of the partnership (87%)**
- Potential for partnership (72%)
- Functional network (69%)
- Development programming (68%)

- **Trust (95%)**

We have our own examples?

➡ ???

We have our own examples?

➡ I think so! Yes!

➡ vibrant sequentes!!!




What are the prospects?

- I am curious about your experiences...
- What cases are in your countries or regions?
- Because they are for sure!
- The future of development depends on our cooperation!
- Symbiosis: look in the same direction 😊



Thank You!

Хвала на пажњи!



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