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## Floating buildings in the hotel, catering and water tourism industry in Poland – Business environment survey

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### Abstract

The paper presents results from social research on the Polish business representatives potentially interested in using the floating buildings. The main purposes of the study were to assess the level of knowledge about floating buildings and diagnose stimulants and inhibitors of their development in the hotel, catering, and water tourism industry.

Combining the quantitative and the qualitative methodology, research was conducted using an on-line survey (CAWI) and Focused Group Interviews (FGI). Both involved a non-probabilistic, purposive sampling to reach a specific subgroup of the industry: owners or employees of catering, hotel or water tourism companies having or considering having a floating building. The group included both new and long-standing companies using facilities on water or with direct and indirect access to the water.

The study identified stimulating and inhibitory factors broken down into internal (context-independent) and external (context-dependent) conditions. Results show that in Poland floating commercial buildings are a niche topic but also a developable one. Although 71% of the respondents notice difficulties resulting from the insufficient infrastructure and 66.5% of them indicate the lack of legal regulations, they also see the potential of floating buildings: depending on the industry, from 90 to 95% respondents find them “definitely attractive” or “rather attractive”. The most common reason for rejecting floating development is the lack of attractive moorages in the area (43.5% answers).

**Key words:** catering industry, commercial buildings, floating buildings, floating architecture, hotel industry, water tourism industry

### INTRODUCTION

Floating buildings, defined as the stationary water-based volumetric structures with permanent land access, serve for a large number of various functions all over the world [LIN *et al.* 2018; PAK 2011]. Mostly they are considered to be residential buildings, therefore they are often called houseboats or floating homes. But research conducted worldwide shows the commercial use of stationary floating structures [KLOCHKO 2018; KOKKRANIKAL, MORRISON 2002; LAMAS, CARRAL 2011; MOON 2011; PAR-

KITNY 2013]. In Poland, only 14% of all floating buildings built after 2000 were houses [PIĄTEK 2018]. Other were commercial objects: apartments for rent, restaurants or marina facilities, which may suggest a significant demand for such buildings in Poland.

The main research objective of the presented study was to diagnose the business conditions of using commercial floating buildings in Poland. The need for such work has been already suggested by other researchers, who claim that future development in this field depends on the market demand [KURYŁEK 2017].

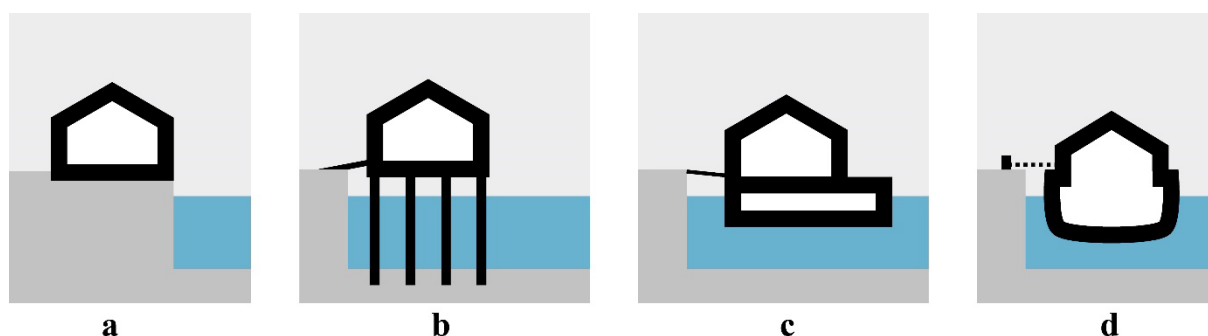


Fig. 1. Different types of water-related architecture: a) waterside building, b) building on stilts, c) floating building, d) adapted ship; source: own elaboration

Both in qualitative and quantitative part of the research, the following definition of a floating building was presented to the respondents: an object founded on a floating foundation, that (1) is not connected rigidly to the shore or bottom and may, like a ship, tilt or sway, (2) rises and falls with water level, and (3) has no propulsion. To differentiate a floating building from other types of water-related architecture [PIĄTEK 2016] used for commercial purposes the respondents were shown an illustration (Fig. 1).

**STUDY METHODS**

Due to the novelty of the subject, exploratory research combining the quantitative and qualitative methodology was designed. It was conducted using computer-assisted web interview (CAWI) and focused group interview (FGI) techniques. Both included a similar range of questions, therefore a complementary set of data was gathered. Besides, such triangulation between methods ensured some level of verification [FLICK 2010].

The quantitative part of the research consisted of an on-line questionnaire with a series of closed and semi-open questions with opinion scales based on the Likert scale<sup>1)</sup> or lists of predefined answers based on previous research on floating buildings [KAŹMIERCZAK 2013; MISZEWSKA-URBAŃSKA 2016]. The questionnaire included algorithmic paths reflecting diversified knowledge and experience of the respondents. The online tool allowed for reaching respondents in different locations and ensuring comfortable conditions for completing the survey (i.e. survey accessed on a computer or personal mobile device, filled in at any time, designed to last approximately 10–15 minutes), as well as gathering structured data that may be compared easily. The impersonal character of the tool increased the chance of direct, straightforward answers.

The qualitative part of the research consisted of two FGI sessions with different experts. The interviews were structured and standardized, conducted by a moderator using a scenario incorporating research questions (i.e. understanding the term of floating building, using commercial floating buildings concerning their industry-specific

advantages and disadvantages). The interviews were held at an FGI laboratory providing the possibility of facilitating discussion with presenting movie clips and pictures of exemplary floating buildings. The size of the samples enabled convenient conversations and a thorough presentation of multiple points of view. Respondents could not only share their opinion, knowledge and experience but also explain their stances and discuss with others [DAYMON, HOLLOWAY 2004].

Both research techniques involved a non-probabilistic, purposive sampling [BABBIE 2007] to reach a specific subgroup of the Polish commercial industry: owners or employees of catering, hotel or water tourism facilities having an object on the water or considering the possibility of having an object on the water. The structure of the CAWI sample is presented in Table 1.

**Table 1.** Structure of the sample in qualitative research (CAWI, (sample number *n* = 65)

Sample characteristics		Percentage of the sample
Sector (a multiple choice question)	hotel	63
	catering	43
	water tourism	29
Company age	1–5 years	17
	5–10 years	27
	over 10 years	56
Object’s distance from the water	on the water	16.9
	with direct access to the water	27.7
	up to 100 m from the water	27.7
	over 100 m from the water	27.7

Source: own study

Aiming the research at a specific group of people with particular knowledge and experience led to a limited sample amount that reached 66 respondents in an online survey and 13 experts in focus group interviews.

**RESULTS**

**EXPERIENCE WITH FLOATING BUILDINGS**

Nearly all respondents (91%) in the quantitative research heard about floating buildings (Fig. 2). This indicates that discussion on the commercial use of the floating buildings is possible among representatives of selected industries in Poland. In the opinion of the respondents in

<sup>1)</sup> Traditionally, a Likert scale allows to determine the relative intensity of acceptance of a given statement using the distinction between “strongly agree”, “agree”, “strongly disagree”, and “disagree” [BABBIE 2007].

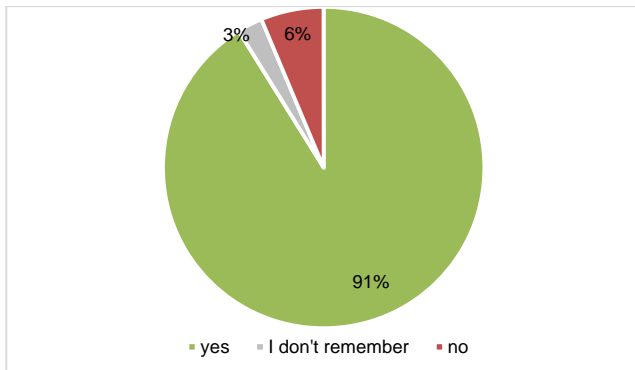


Fig. 2. Answers to the question: Have you ever heard of floating buildings? (sample number  $n = 79$ ); source: own study

qualitative research, the definition of a floating building is rather clear. They pointed out that there is no such definition in the Polish legal system which leads to many difficulties in deploying and using floating buildings.

The most common reason for considering the possibility of using floating buildings is their convenient access to the water (Fig. 3). Three following reasons (increasing attractiveness of the services provided, conducting innovative activities, and increasing range of activity) are connected to growth – expanding the business beyond what could be seen as a “standard”. This may lead to the conclusion that floating building is seen as a way to develop a business by providing an unexpected feature.

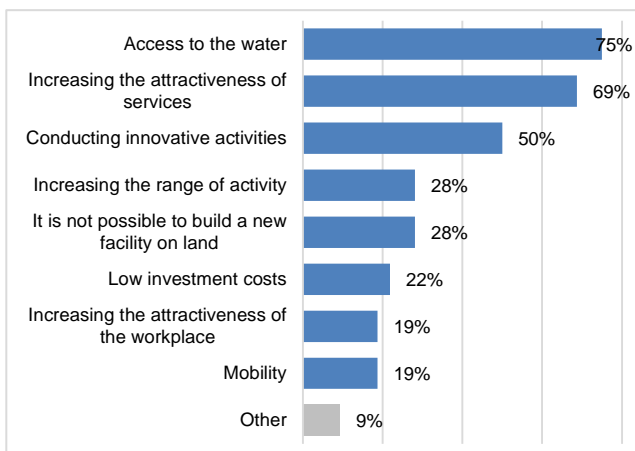


Fig. 3. Reasons for considering the use of floating buildings (sample number  $n = 23$ , a multiple choice question); source: own study

Consequently, the reason for rejecting the possibility of using floating buildings is the lack of attractive water reservoirs in the area or available moorages on such waters (Fig. 4).

Respondents who considered floating development in the past had focused mainly on the hotel and catering function (Fig. 5). In the first group, there were many more individual houses (47%) than hotels or hostels (only 7%). Other purposes were cafés (40%), restaurants (40%) and pubs (27%). Water facilities were considered less often: floating ship terminals (27%) or marina offices (13%). Qualitative research confirmed that floating buildings are

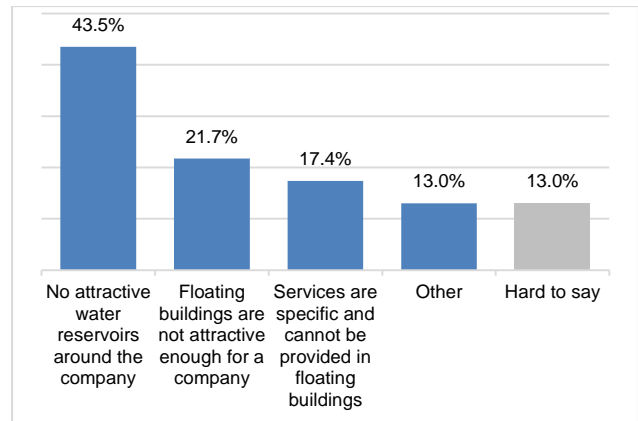


Fig. 4. Reasons for not considering the use of floating buildings (sample number  $n = 23$ , a multiple choice question); source: own study

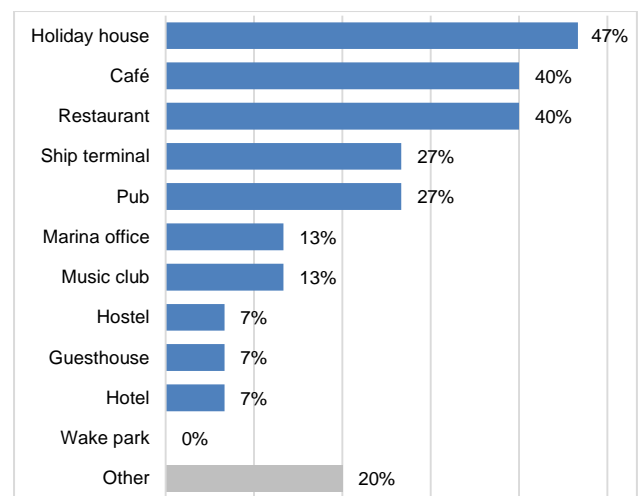


Fig. 5. The function of floating buildings planned by the respondents (sample number  $n = 15$ , a multiple choice question); source: own study

seen mostly as clubs, restaurants, art galleries, leisure or sport objects.

## BUSINESS ATTRACTIVENESS

According to a quantitative study, the business environment perceives floating buildings as the best of all architectural solutions on the water or next to the water. Interestingly, adapted barges and ships were ranked as the least attractive, as a compromise not exactly responding to all business needs (Fig. 6). It was confirmed in qualitative research. On the contrary to the custom-built floating buildings, transformed vessels were considered difficult to replicate in case of scaling the business up and require a qualified staff to operate.

Overall conditions for using floating buildings in Poland are seen as favourable more often than unfavourable in all analyzed industries with a significant prevalence of positive answers in the water tourism industry (Fig. 7). More balanced opinions in the catering and hotel industry may be connected with higher initial costs and a more long-time business model in this case.

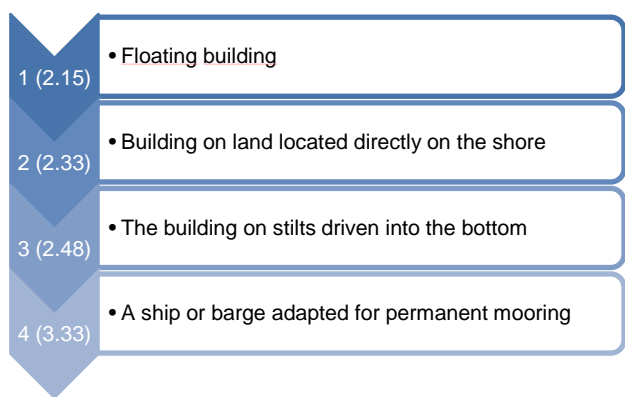


Fig. 6. Ranking of different water-related architectural solutions according to their attractiveness (sample number  $n = 68$ ; respondents were asked to sort the solutions starting from the most attractive one; average ranking score given in brackets); source: own study

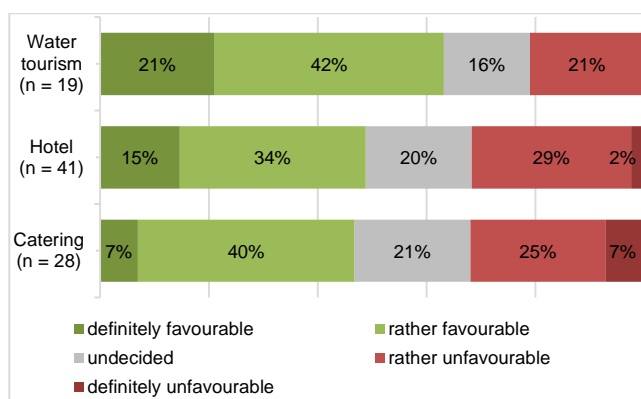


Fig. 7. Answers to the question: How do you perceive the national conditions for using floating buildings in your industry?; source: own study

Similarly, the overall assessment of business attractiveness is positive. When questioned whether floating buildings are attractive for the industry, representatives of all sectors responded positively (definitely or rather) in high numbers (93% in catering, 90% in hotel, and 95% in water tourism), without a single “definitely no” answer (Fig. 8). Again, a demand for a larger and more comfortable building in the case of the Horeca industry might be the reason behind negative answers.

Further in-depth analysis of the business context allows mapping challenges which might be perceived as po-

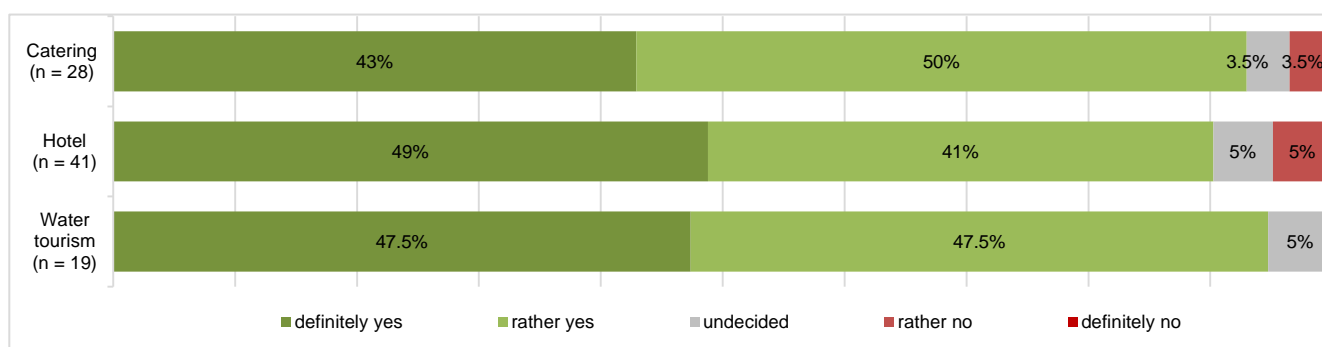


Fig. 8. Answers to the question: Do you think that floating buildings are attractive for your industry?; source: own study

tential threats preventing from undertaking the floating building development. First and foremost, as FGI respondents reported, the definition of floating building in the Polish legal system is unclear. The possibility of launching the business on the water is highly dependent on local authorities and how they interpret the law. Also, the costs and incomes of business activity in a floating building are difficult to estimate because of the following factors:

- a) difficulties in obtaining a long-term moorage permit;
- b) uncertain final construction costs (due to small number of completed reference buildings);
- c) limited financing options as there is no real-estate as loan collateral;
- d) probable loss of value of the floating object instead of the increase in value in the long term.

Another important finding is that floating buildings seem to be seasonal ones. The popular perception of enterprises undertaken in them is strongly influenced by the seasonal character of how open waters are used in Poland. When it comes to the problem of extending the operation of the floating building for the winter season, there is a dilemma of supply and demand: are there no customers because there is no offer, or is there no offer because there are no customers? Nevertheless, respondents in the qualitative study believe the operational period can be extended by improving the offer in the floating buildings, i.e. by providing a higher standard addressed to foreign customers. With all the above, the decision process to implement floating buildings in business projects in Poland is long and complex.

### STIMULATING AND INHIBITORY FACTORS

Factors that favour and limit the use of floating buildings in Poland were broken down into internal (context-independent) and external (context-dependent) conditions.

The most stimulating internal factors are the attractiveness of being on the water (95%) and the originality of the solution (94%). The following features are mobility (78%), the potential of development without land (75%) and moorage for water vessels (70%). Quite surprisingly in the context of sustainability and climate resilience discourse, flood resistance is mentioned as last on the list (Fig. 9).

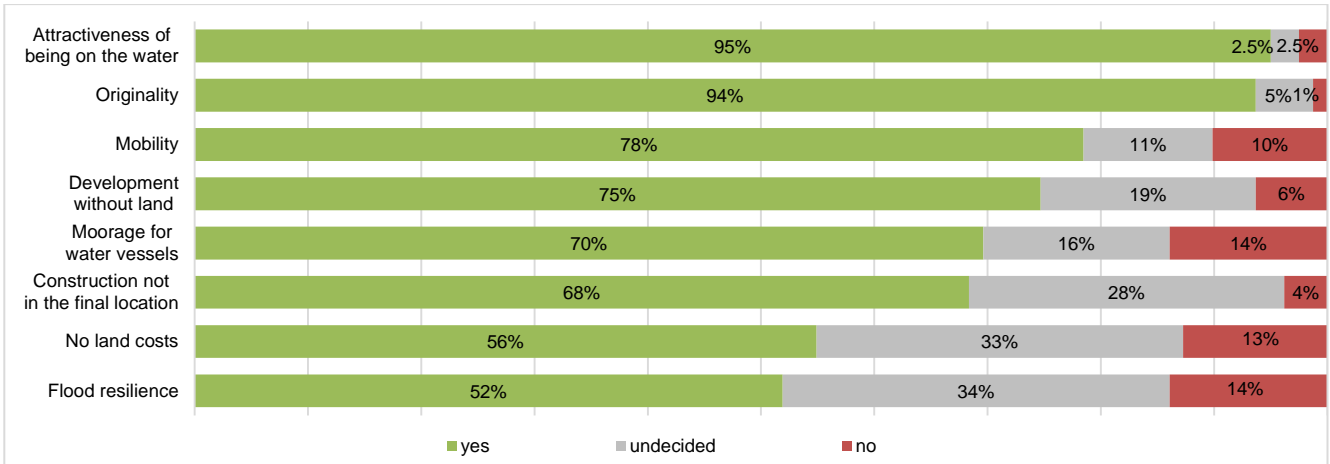


Fig. 9. Answers to the question: Please assess whether the listed features of floating buildings favour their use in Poland in your industry (sample number  $n = 79$ ); source: own study

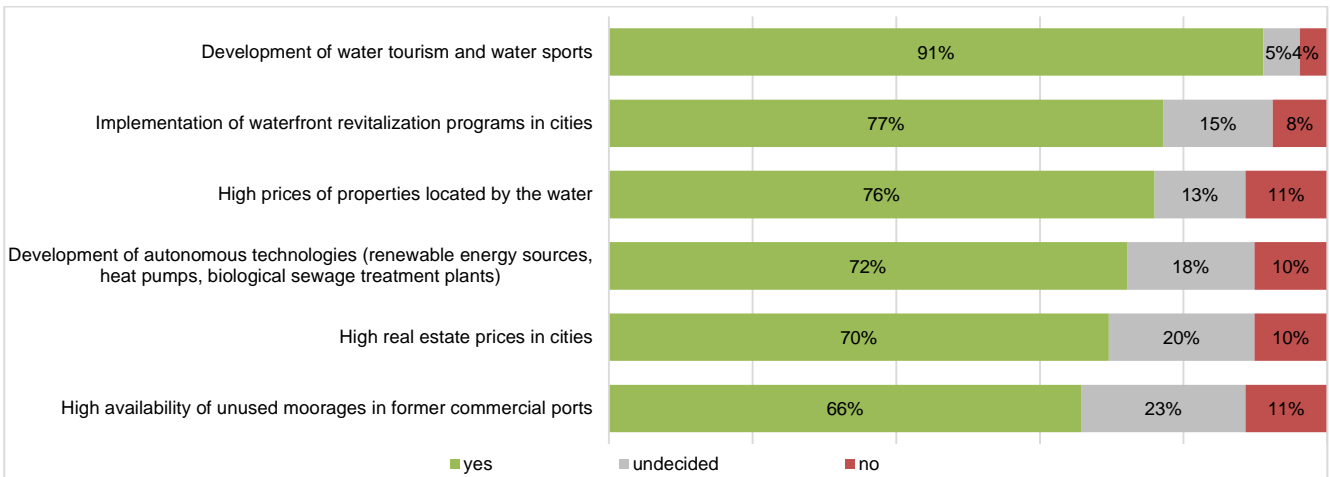


Fig. 10. Answers to the question: Please assess whether these external factors favour the use of floating buildings in Poland in your industry (sample number  $n = 79$ ); source: own study

The most stimulating external factor is the development of water tourism and water sports (91%, Fig. 10). The following issues are: implementation of waterfront revitalization programs in cities (77%), high prices of properties located by the water (76%), availability of autonomous technologies, i.e. use of renewable energy sources, heat pumps, biological sewage treatment plants (72%), and high real estate prices in cities (70%).

Inhibitory internal factors are mainly practical limitations: from the technical difficulties of the construction and transport of large floating buildings (59%) and unavailable mortgage financing (59%), which are important for investors at the initial phases of the development, to the movement of the structures in bad weather (54%) and difficulties with parking (51%), which are important for customers and may limit their demand for services in floating buildings. The lack of high greenery around the building was not mentioned as an important limitation (Fig. 11).

External limitations create the longest list in four areas of analysis (Fig. 12). The main factors are problems with the deployment: lack of infrastructure on the quays (71%), poor navigation conditions (50%), and lack of suitable locations for floating buildings (46%). Climate-related issues

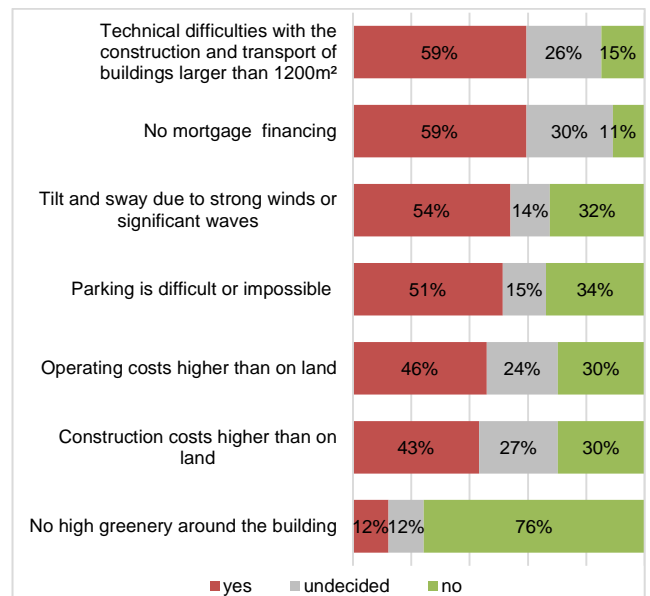


Fig. 11. Answers to the question: Please assess whether the listed features of floating buildings limit their use in Poland in your industry (sample number  $n = 79$ ); source: own study



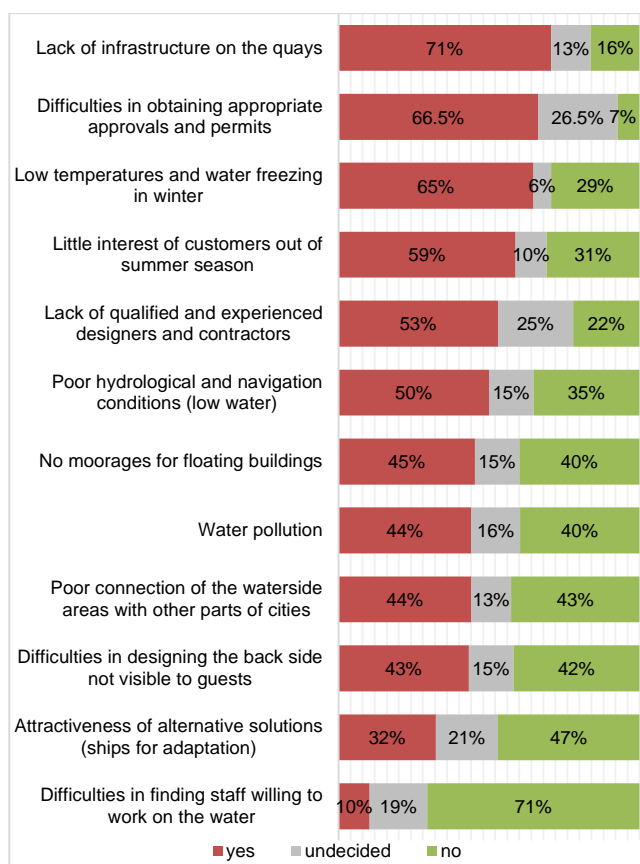


Fig. 12. Answers to the question: Please assess whether these external factors limit the use of floating buildings in Poland in your industry (sample number  $n = 79$ ); source: own study

such as low temperatures in winter (65%) and little interest of customers out of the summer season (59%) are important as well. Other external inhibitory factors concern the formal and economic aspects: difficulties in obtaining appropriate approvals and permits (66%) and the lack of qualified and experienced designers and contractors (53%).

## DISCUSSION

Previous research on floating architecture was focused on residential buildings [NILLESEN, SINGELENBERG 2011; PB Online 2010], therefore the described study can be regarded as a novel one.

The CAWI sample size was affected by two obstacles in the research process. Firstly, due to the niche character of the floating sector in Poland, it was difficult to achieve a larger sample. Secondly, the precise requirements for respondents' experience and knowledge further influenced negatively the size of the sample. However, the number of respondents (66 in quantitative research and 13 more in FGI) has to be considered relatively high when compared to the total number of all 49 floating buildings built in Poland between 2003 and 2017 [PIĄTEK 2018]. Therefore, despite the small sample, gathered data are sufficient in terms of the research goals, especially when taking into account that the study had an exploratory character.

Moreover, the study showed that only 23 out of 66 CAWI respondents have not considered nor planned to use

such facilities for the past five years. And as many as 15 respondents envisage such an idea, and another 10 do not exclude it in the next five years. These declarations allow for forecasting a continuation of the growing trend of realizing new floating buildings in Poland.

Even though mapping the possible solutions for overcoming the inhibitory factors was not the main goal of the survey, the respondents were likely to propose some ideas that can already be found in other countries. Firstly, clear and consistent legislation for the construction and operation of floating buildings, like the one implemented in the Netherlands [Ministerie... 2009; NEN 2011] is believed to be necessary. Secondly, as proved in Hamburg [Bezirksamt... 2017], publicly funded infrastructural projects focused on providing attractive moorages at the waterfronts are essential for floating development.

## CONCLUSIONS

Floating buildings can be a way to compete with land-based facilities. Their main advantages are the attractiveness of water proximity, originality and mobility. In some cases, it may be a lower cost as well.

Respondents believe that the conditions for the commercial use of floating buildings in Poland are favourable. They know how floating buildings can be successfully used in their industries. Even though they notice serious difficulties: lack of a complete legal framework, troubles with cost and profit assessment, challenges with finding attractive moorages with necessary infrastructure. These risks reduce the attractiveness of using commercial floating buildings in Poland.

Overall interest in floating buildings in Poland can be described as a niche but growing trend. Respondents suggest that projects completed so far have the potential to increase the popularity and understanding of the concept of commercial floating architecture and advise further promotion of the idea among both potential investors and users.

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## REFERENCES

BABBIE E. 2007. *Badania społeczne w praktyce* [The practice of social research]. Warszawa. Wydaw. Nauk. PWN. ISBN 83-01-14068-2 p. 660.

BEZIRKSAMT HAMBURG-MITTE 2017. *Hausboote und Schwimmende Häuser im Bezirk Hamburg-Mitte*. Pressemappe [Houseboats and floating houses in the district of Hamburg-Mitte. Press kit] [online]. Hamburg. [Access 12.02.2020]. Available at: <https://www.hamburg.de/contentblob/6931486/c599aa63450c7b4eff7a000588df420d/data/pressemappe.pdf>

DAYMON CH., HOLLOWAY I. 2004. *Qualitative research methods in public relations & marketing communication*. London, New York. Routledge. Reprint 2004. ISBN 0415222737 pp. 293.

FLICK U. 2010 *Projektowanie badania jakościowego* [Designing qualitative research]. Warszawa. Wydaw. Nauk. PWN. ISBN 9788301167059 pp. 80.

- KAŹMIERCZAK I. 2013. Paradoxs budynków pływających [The paradox of floating buildings]. *Warunki Techniczne*. Nr 2 p. 57–61.
- KLOCHKO A.R. 2018. Economy class hotels on the cities embankments. *Materials Science Forum*. Vol. 931 p. 785–789.
- KOKKRANIKAL J., MORRISON A. 2002. Entrepreneurship and sustainable tourism: The houseboats of Kerala. *Tourism and Hospitality Research*. Vol. 4. No. 1 p. 7–20. DOI 10.4028/www.scientific.net/MSF.931.785.
- KURYŁEK A. 2017. Aspekty prawne realizacji oraz rejestracji obiektów sytuowanych na wodzie [Legal aspects of realisation and registration of the stationary floating objects]. *Inżynieria Morska i Geotechnika*. Nr 1 p. 3–7.
- LAMAS M., CARRAL L. 2011. Offshore and coastal floating hotels: Floatels. *International Journal of Maritime Engineering*. Vol. 153. P. A1 p. A41–A53.
- LIN Y.-H., CHIH L.Y., TAN H.-S. 2018. Design and functions of floating architecture – A review. *Marine Georesources & Geotechnology*. Vol. 37. No. 7 p. 880–889. DOI 10.1080/1064119X.2018.1503761.
- Ministerie van VROM 2009. Drijvende woningen en de bouwregelgeving – Handreiking voor ontwikkelaars, bouwers en gemeentelijke plantoetsers [Floating homes and the building regulations. Guide for developers, builders and municipal planning assessors]. Den Haag. Ministerie van Volkshuisvesting, Ruimtelijke Ordening en Milieubeheer pp. 32.
- MISZEWSKA-URBAŃSKA E. 2016. Modern management challenges of floating housing development. *Real Estate Management and Valuation*. Vol. 24. No. 1 p. 31–40. DOI 10.1515/remav-2016-0003.
- MOON CH. 2011. A case study on the architectural planning of floating hotel. *Journal of Korean Navigation and Port Research*. Vol. 35. No. 6 p. 515–522. DOI 10.5394/KINPR.2011.35.6.515.
- NEN 2011. NTA 8111 nl Drijvende bouwwerken [NTA 8111 nl Floating constructions]. Delft. Nederlands Normalisatie-Instituut pp. 59.
- NILLESEN A.L., SINGELENBERG J. 2011. Waterwonen in Nederland. *Architectuur en stedenbouw op het water* [Amphibious housing in the Netherlands. Architecture and urbanism on the water]. Rotterdam. NAI. ISBN 9056627805 pp. 160.
- PAK S.-S. 2011. A Study on architectural type and design characteristics of floating architecture. *Journal of Korean Navigation and Port Research*. No. 5 p. 407–414. DOI 10.5394/KINPR.2011.35.5.407.
- PARKITNY W. 2013. Jednostki pływające wykorzystywane w obsłudze turystycznej na Wiśle w Krakowie [Ships and other units used in touristic service on Vistula River in Cracow]. *Logistyka*. Vol. 2013. No. 5 p. 66–70.
- PB Online 2010. Domy na wodzie alternatywą dla tradycyjnego domu/mieszkania? [Houses on the water as an alternative to a traditional house/apartment?] [online]. Wrocław. PB Online Sp. z o.o. [Access 14.10.2010]. Available at: <https://tabelaofert.pl/domy-na-wodzie-alternatywa-dla-tradycyjnego-domu-mieszkania>
- PIĄTEK Ł. 2016. Displacing architecture? From floating houses to ocean habitats: Expanding the building typology. In: *Education for research, research for creativity*. Ed. J. Słyk, L. Bezerra. Warsaw. Wydział Architektury Politechniki Warszawskiej p. 273–280.
- PIĄTEK Ł. 2018. Architektura budynków pływających: uwarunkowania i kierunki rozwoju w Polsce po roku 2000 [Architecture of floating buildings: Conditions and directions of development in Poland after 2000]. PhD Thesis. Warszawa. Politechnika Warszawska pp. 281.