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An Ethnosemantic Study of the 'Teknofak' Lexicon in Biak Culture Based on Visual Data from the Wereldmuseum Collection

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Abstract

This study aims to identify and describe the technological lexicon within Biak culture and to uncover the relationship between the form, function, use and cultural significance of artifacts through an ethnosemantic approach. The study employs a qualitative approach with a linguistic ethnography design. The research data consist of visual data on artifacts from the Wereldmuseum collection and verbal data obtained through observation and in-depth interviews with six native speakers of the Biak language. The analysis was conducted through the stages of identification, classification based on the type and function of the artifacts, and ethnosemantic analysis. The results of the study indicate the existence of 20 techno-factual lexical items representing various aspects of Biak society's life, including protection, rituals, food processing, personal care, fishing, jewelry, and traditional boat technology. Each lexical item is linked to the material characteristics, function, method of use, and cultural context of the artifact. The analysis indicates that techno-factual lexicons not only serve to name objects but also represent the knowledge, values, identity, experiences and cultural conceptions of the Biak community. These findings underscore the importance of documenting techno-factual lexicons as part of efforts to preserve the language and ensure the sustainability of the Biak community's cultural knowledge.

Keywords: Teknofak lexicon; ethnosemantics of the Biak language; artefacts from the Wereldmuseum

I. INTRODUCTION

Language not only serves as a medium of communication but also represents a society's knowledge, experiences and cultural practices. This relationship is significant in the study of material culture, as artifacts reflect the ways in which communities utilize their environment, develop technology and meet their basic needs (Binford, 1962; Salzmann et al., 2012). In the context of social change and modernization, the declining use of traditional artifacts can lead to the loss of knowledge and vocabulary associated with these objects.

The sustainability of language and cultural knowledge is also influenced by changes in the social environment and the narrowing of the domains in which language is used (Amano et al., 2014; Alsaawi, 2019). The family, education and community play a vital role in the intergenerational transmission of linguistic and cultural knowledge (Fishman, 1991; Holmes, 2013; Little, 2023). Language documentation must encompass a lexicon that represents the cultural knowledge and practices of a community.

One such domain is the techno-factual lexicon, which refers to objects or artifacts resulting from technology and the cultural practices of a community. Technological artifacts not only serve a practical function but can also represent identity, social values and cultural knowledge (Rahardjo et al., 2022). The documentation of artifacts through visual data also provides an opportunity to systematically link material objects with linguistic information (Riyadi et al., 2023).

Ethnosemantic studies view language as a representation of a community's knowledge system and cultural conceptions (Bohnemeyer, 2021; Salzmann et al., 2012). Lexical meaning is not only related to the referent but also reflects the experiences and ways in which speakers understand cultural reality (McGregor et al., 2018). The ethnosemantic approach enables the relationships between lexical forms, artifacts, functions, usage and cultural meaning to be analyzed in an integrated manner (Leba et al., 2023; Pesiwarissa, 2023).

Research on the cultural lexicon demonstrates that language can represent the material characteristics, practices, environment and cultural values of a community. This is evident in studies of the lexicon of batik and woven fabrics (Kristianingsih et al., 2021; Fitriani et al., 2024), traditional medicine (Ashfiya et al., 2026), and traditional wrappings (Nugrahani & Parela, 2022). These findings reinforce the importance of examining cultural lexicons not only on the basis of linguistic meaning but also in light of the underlying cultural context.

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Previous research has addressed the linguistic structure, vocabulary, ethnography and cultural expressions of the Biak language. The grammar of Biak has been documented by Fautngil and Rumbrawer (2002), while Soeparno (1977) documented the vocabulary through the Biak–Indonesian Dictionary. Studies by Kamma (1981), the Ministry of Education and Culture (1990), and Morin and Dimara (2023) have further enriched the documentation of the culture and expressions of the Biak community.

Nevertheless, previous research has not specifically focused on the technological lexicon as a representation of the material culture of the Biak community. Studies of the Biak language have largely focused on structure, vocabulary, expressions and cultural descriptions, where the relationship between the lexicon and artifacts has not yet been analyzed in an integrated manner (Fautngil & Rumbrawer, 2002; Soeparno, 1977; Kamma, 1981). Furthermore, the use of visual data on artiefacts as a basis for linguistic identification remains limited.

This issue is also linked to language preservation. The documentation and digitization of regional languages can support the sustainability of linguistic and cultural knowledge (Hasan & Iribaram, 2022; Mantri, 2021). However, research on language preservation generally focuses on the social domain and intergenerational transmission, whereas the sustainability of the lexicon as it relates to cultural artifacts has not been extensively studied (Fishman, 1991; Charo & Ong'onda, 2022; Pitton, 2013).

Based on this review, this study identifies three main gaps. First, specific studies on the technophonic lexicon of the Biak language remain limited. Second, previous research has not comprehensively integrated visual data on artiefacts with ethnosemantic analysis. Third, the relationship between the form, function, use and cultural meaning of artiefacts has not been analyzed as a unified system of knowledge.

This study offers three main contributions. First, visual data of artiefacts from the Wereldmuseum collection are used as the basis for identifying the technological lexicon. Second, an ethnosemantic approach is employed to analyze the relationship between form, function, use and cultural meaning (Bohnemeyer, 2021; Leba et al., 2023). Third, the study reveals the cultural values and local knowledge systems represented through the techno-factual lexicon of the Biak community.

The novelty of this study lies in the integration of language, ethnosemantics, material culture, and visual data on artiefacts within the study of the Biak language lexicon. This study aims to identify and describe the techno-factual lexicon within Biak culture based on visual data of artie facts from the Wereldmuseum, using an ethnosemantic approach. The analysis focuses on the relationship between form, function, use and cultural meaning as part of the Biak community's knowledge system.

II. METHODS

This study employs a qualitative approach with a linguistic ethnography design based on ethnosemantics. This approach was chosen to examine the relationship between language and the material culture of the Biak community through the technophonic lexicon. The analysis focuses on the interrelationships between lexical forms, artifact forms, function and meaning within the cultural context of the Biak community.

The data sources consist of visual and verbal data. The visual data comprise photographs of Biak cultural artiefacts obtained from the Wereldmuseum Collection. The visual data are used as a basis for identifying the forms and types of artiefacts. The verbal data consists of the names of artiefacts in the Biak language, as well as information regarding their functions and uses, obtained through interviews.

There were six research informants. Informants were selected through purposive sampling based on the criteria of being native speakers of the Biak language, aged over 40, possessing an understanding of Biak's traditional culture and artiefacts, and being recognized as having knowledge of the local culture. The selection of informants was carried out to obtain linguistic and cultural information relevant to the artiefacts under study.

Data were collected through documentary research, observation and in-depth interviews. Documentary research was conducted on photographs of Biak cultural artiefacts available in the Wereldmuseum collection. Observations were conducted in Kampung Dwar to gather information on the presence and use of traditional artiefacts in community life.

In-depth interviews were conducted with the six informants to obtain information on the names of the artiefacts in the Biak language, their functions, and how they are used. The interviews were also used to clarify the relationship between the names, forms, and functions of the artiefacts. These three techniques were used in an integrated manner to link visual data with the linguistic knowledge and cultural experiences of the speakers.

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Data analysis was carried out in stages by integrating visual and verbal data. The first stage involved the identification of techno-lexical terms based on artie fact data and informants' accounts. The second stage involved classification based on the type and function of the artie facts. The third stage involved an ethnosemantic analysis of the form, function and meaning of the lexicon within the cultural context of the Biak community.

This analysis is used to explain how an artie fact is named, recognized and understood by speakers of the Biak language. Thus, the analysis not only produces a lexical list but also explains the interrelationships between the form of the artie fact, lexical form, function and cultural meaning.

Data validity was ensured through source and methodological triangulation. Source triangulation was carried out by comparing information from six informants regarding the names, functions, uses and meanings of the artie facts. Methodological triangulation was carried out by comparing visual documentation, observational findings and interview data. Both forms of triangulation were used to ensure data consistency and enhance the credibility of the analysis results.

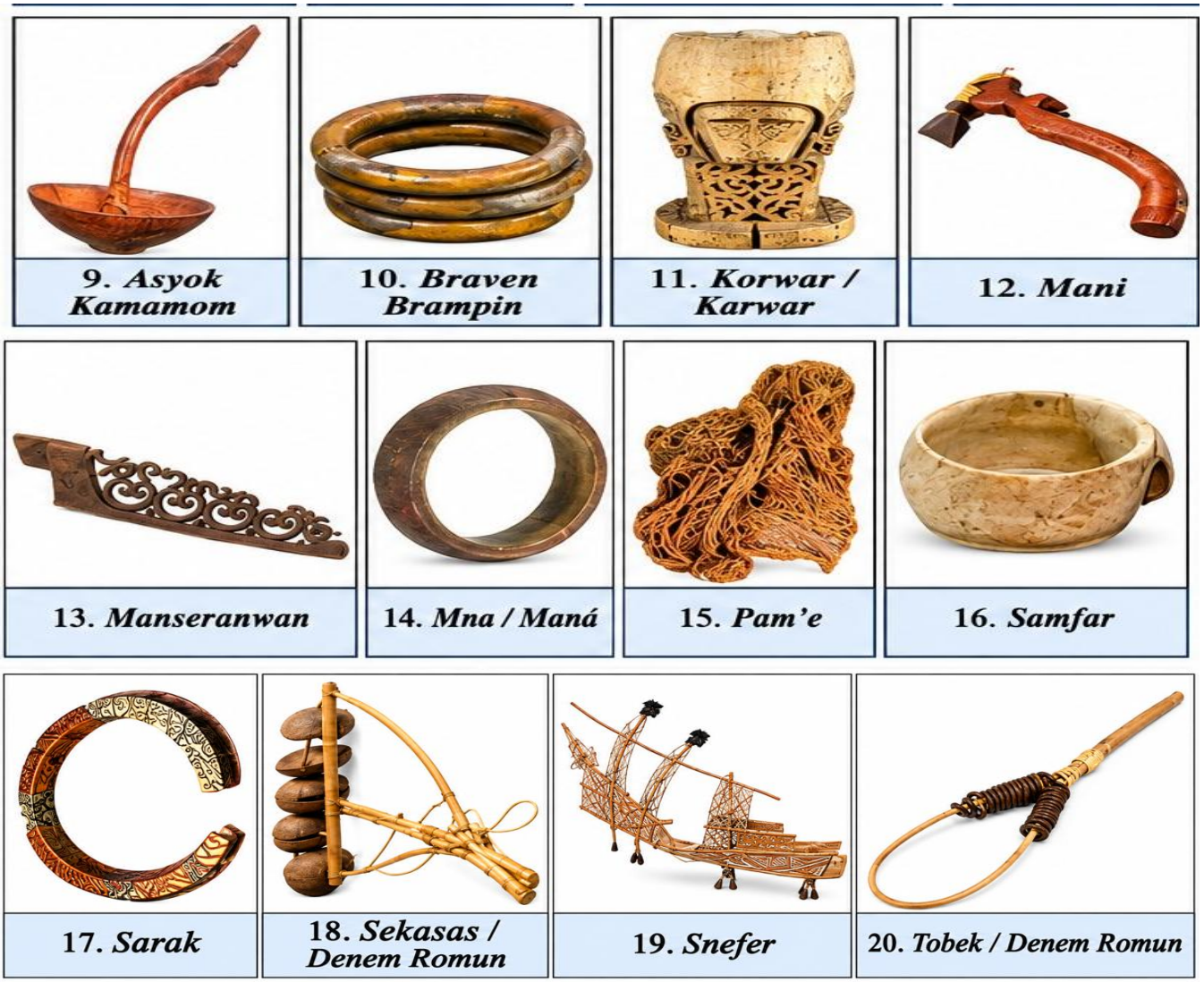
III. RESULTS AND DISCUSSION

The identification of visual data on Biak cultural artiefacts revealed 20 techno-lexical items representing various forms of the material culture of the Biak people. The identification was carried out using visual data from the Wereldmuseum as a basis for recognizing the forms and types of artie facts. This identification was subsequently confirmed through field observations and interviews with Biak language speakers in Kampung Dwar.
The integration of visual and verbal data enabled each artiefact to be linked to its name in the Biak language. Information from informants was also used to confirm the function and use of each artiefact. The identification of lexical items was based not only on the visual characteristics of the objects but also on the linguistic knowledge and cultural experience of the speakers.

Figure 1. Twenty Technological Artefacts in Biak Culture



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Source: Research data and documentation from the Wereldmuseum collection.

As shown in Figure 1, the identified artifacts vary in shape, size, material and function. They include weapons, sculptures and ritual objects, household items, food-processing tools, fishing gear, personal accessories, and parts of traditional boats. This diversity indicates that the techno-lexicon relates to various aspects of the material life of the Biak people.

Some lexical terms refer to tools used in everyday activities. 'Ada/Adai' refers to a shield, 'man' to an axe, 'asis' to a comb, 'asuser' to a sago sieve, and 'asyok kamamom' to a stirring spoon. Other terms refer to arti facts with social and ritual functions, such as 'afdander', 'amfyanir/konor', 'korwar/karwar', 'brawen brampin', 'mna/mana', 'samfar' and 'sarak'.

Meanwhile, 'anas tobek', 'arsam', 'pam'e', 'sekasas/denem romun' and 'tobek/denem romun' relate to fishing activities. Manseranwan and snefer are associated with traditional Biak boats. These data indicate that the technophac lexicon represents local technologies that have developed within various aspects of community life.

In terms of materials, the artie facts discovered utilize a diverse range of materials. These include wood, bamboo, rattan, palm fiber, coconut shells, shell, ebony, iron, brass and other metals. This diversity of materials demonstrates the utilization of resources available within the community's environment. The materials also serve as one of the elements that help distinguish the characteristics and functions of the artiefacts.

Table 1. Identification of the Biak Cultural Technological Lexicon

No.	Biak Lexicon	Teknofak Identification	Material	Inventory Number
1	Ada / Adai	Shield	Wood	RV-929-775
2	Afdander	Statue/amulet	Wood	TM-43-82
3	Afyak	Neck rest/pillow	Wood	RV-602-34
4	Amfyanir / Konor	Statue	Wood	RV-2432-2

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5	Anas Tobek	Life jacket	Coconut shell	RV-929-503
6	Arsam	Fishing net	Palm fibre/wood fibre/rattan	RV-929-502
7	Asis	Comb	Wood/bamboo	RV-602-52
8	Asuseri	Sago sieve	Rattan/straws	RV-592-44
9	Asyok Kamamom	Stirring spoon	Coconut shell/wood/rattan	RV-592-42
10	Brawen Brampin	Wrist ornament	Metal	RV-09-365
11	Korwar / Karwar	Spirit vessel/statue	Wood	RV-2442-2
12	Man	Axe	Wood/iron	RV-4313-2
13	Manseranwan	Carved boat stern	Wood	TM-43-76
14	Mna / Mana	Ritual bracelet	Ebony	RV-929-183
15	Pam'e	Fishing net	Palm fibre rope	RV-602-41
16	Samfar	Bracelet	Shell	RV-5230-2
17	Sarak	Bracelet	Iron/brass	RV-09-370
18	Sekasas / Denem Romun	Shark trap	Wood/rattan/rope/coconut shell	RV-929-508
19	Snefer	Boat prow	Wood	RV-2401-3
20	Tobek / Denem Romun	Shark trap	Wood/rattan/coconut shell	RV-1528-383

Source: Research data and documentation from the Wereldmuseum collection.

Table 1 shows that 20 techno-factual lexical items have material referents that can be visually identified. The inventory number serves as a marker to link the lexical data to the artifacts documented in the Wereldmuseum collection. Thus, the visual and linguistic data have a traceable relationship.

- These identification results indicate that the techno-factual lexicon in the Biak language is not merely a set of words used to name objects. This lexicon is also linked to various aspects of community life. These findings form the basis for analyzing the relationship between artifact form, function and meaning from an ethnosemantic perspective.

An ethnosemantic analysis of 20 lexical items reveals that each lexical item is linked to the characteristics of the artifact to which it refers. This relationship can be observed through the artifact's material form, function, mode of use, and cultural context. Using this approach, lexical items are understood as part of the Biak community's knowledge system.

The form of the artifact is a key element in understanding techno-factual lexical items. This form encompasses physical characteristics, construction, dimensions and the materials used. Function refers to the artifact's utility in community activities. Ethnosemantic meaning relates to the cultural knowledge and conceptions associated with the artiefact's use.

Based on these relationships, the 20 techno-factual lexical items can be described as follows

1. Ada / Adai (A-da) / (A-dai)

A traditional weapon in the form of a rectangular wooden shield, characterized by an oblong button on the cross-section and an elongated central ridge. It served as a means of self-defence in warfare and was used by the Biak community prior to 1887. From an ethnosemantic perspective, the ada/adai represents strength, self-defence and the military identity of the Biak people in the past. (Dimensions 164 × 34 cm, No. RV-929-775, image no. 91; source: wereldmuseum).

2. Afdander (Af-dan-der)

A small, human-shaped statue depicting a crouching figure, used as an amulet for self-defence or personal protection. Ethnosemantically, the 'afdander' represents the community's belief in the symbolic power of sacred objects as guardians of safety and enhancers of individual courage. (No. TM-43-82, image no. 347, source: wereldmuseum).

3. Afyak (A-fyak)

A neck support and sleeping pillow made of wood with specific proportions, often depicting ancestors or clan symbols. The afyak serves as a headrest while sleeping and is believed to provide protection and spiritual support to its owner. From an ethnosemantic perspective, the afyak represents the relationship between humans and their ancestors, as well as the reinforcement of clan identity within Biak culture. Example image with inventory no.: RV-602-34; image sequence no.: 19 (source: wereldmuseum)

4. Amfyanir / Konor (Am-fya-nir) / (Ko-nor)

A traditional carved wooden statue depicting a human figure standing upright with outstretched arms. It serves as a representation of sacred art associated with leadership and power. From an ethnosemantic perspective, the

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amfyanir/konor represents a fusion of woodcarving, authority and religious significance rooted in the spiritual system and ancestral heritage of the Biak people. (Example of a sculpture measuring 65 ×: 77cm; Inventory No.: RV-2432-2; Image sequence number on the website: 248; source: wereldmuseum).

5. Anas Tobek (A-nas To-bek)

A traditional bird-shaped float made from coconut shell, known to the people of Biak through the influence of the Ternate community since the late 19th century. It is used to assist with activities on the water and to ensure safety while at sea. From an ethnosemantic perspective, the anas tobek represents the adaptive creativity of coastal communities and humanity's close connection with the marine environment as the center of cultural life. Dimensions: 12 x 26 x 24 cm; Inventory number: RV-929-503; Image sequence number on the website: 67; source: wereldmuseum).

6. Arsam (Ar-sam)

A small traditional net made from ijuk fiber, wood fiber or rattan, woven in a specific pattern. It serves as a tool for catching small fish, including those poisoned with tuba root, in the subsistence practices of the Biak people. From an ethnosemantic perspective, the arsam represents weaving skills, ecological knowledge and adaptive local technology passed down through generations. Illustration example Dimensions: Length 56 cm; width 15.5 cm; inventory number: RV-929-502; image sequence number on the website: 66; source: wereldmuseum).

7. Asis (A-sis)

A traditional comb made of wood or bamboo with 19 teeth. It is used for combing and tidying hair and has been in use since before 1887. From an ethnosemantic perspective, the asis represents traditional self-care practices and symbolizes the continuity of material culture passed down through generations. (Dimensions: L 30.5 cm; Inventory number: RV-602-52; Image sequence number on the website: 34; source: wereldmuseum).

8. Asuser (A-su-ser)

A traditional sago sieve made from rattan fiber or palm fronds. This tool is used to separate sago flour from the pulp during sago processing. From an ethnosemantic perspective, the 'asuser' represents the traditional knowledge and local wisdom of the Biak people in utilizing natural resources to meet their food needs. (Dimensions: 41 × 28 cm. Inventory number: RV-592-44. Image sequence number on the website: 14; source: wereldmuseum).

9. Asyok Kamamom (As-yok- Ka-ma-mom)

A traditional stirring spoon made from coconut shell and wood with a curved handle, assembled using rattan fiber bindings. From an ethnosemantic perspective, this tool reflects the community's creativity and skill in utilizing natural resources for everyday domestic needs. (Dimensions: 35.5 x 10 cm; Inventory number: RV-592-42; Image sequence number on the website: 13; source: wereldmuseum).

10. Brawen Brampin (Bra-wen- Bram-pin)

A metal wrist ornament used in traditional ceremonies and ritual activities by the Biak community. This object serves as an accessory to traditional dress as well as a symbol of identity and social status. From an ethnosemantic perspective, the brawen brampin represents aesthetic value, honor, and a symbolic connection between the body and the culture of the Biak people. (Inventory number: RV-09-365; Image sequence number on the website: 4; source: wereldmuseum).

11. Korwar / Karwar (Kor-war) / (Kar-war)

A wooden statue that serves as a vessel for the spirit of the deceased, with a hollow in the head to house a human skull. This statue usually contains the skull of a person of high standing or the eldest child, serving as a temporary abode for the departed soul. From an ethnosemantic perspective, the korwar or karwar represents reverence for ancestors, social status, and the spiritual connection between the living and the deceased within Biak culture. Dimensions: 40 cm; head 26 x 20.5 cm; Inventory number: RV-2442-2; Image sequence number on the website: 2; source: wereldmuseum).

12. Man (Man)

A traditional axe with a wooden handle and an iron blade, used for felling and splitting wood in domestic and carpentry work. From an ethnosemantic perspective, the 'man' represents the community's relationship with nature, craftsmanship, and is a symbol of perseverance within local traditions. Dimensions: 43.5 × 20.5 cm; Inventory number: RV-4313-2; Image sequence number on the website: 294; source: wereldmuseum).

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13. Manseranwan (Man-se-ran-wan)

Wood carving with an openwork motif mounted on the stern of a traditional Biak boat. This carving serves as both a structural element and a decorative feature, as well as a marker of aesthetic identity within maritime tradition. Ethnosemantically, the manseranwan represents the Biak people's cosmological view of the relationship between humans and the sea, whilst also signifying social status and group identity within the continuity of maritime culture. (Dimensions: 117.8 x 7.3 x 27.5 cm (46 3/8 x 2 7/8 x 10 13/16 inches); Inventory number: TM-43-76; Image sequence number on the website: 342; source: wereldmuseum.

14. Mna / Mana (Mna) / (Ma-na)

An ebony bracelet worn on the upper arm or above the elbow; typically more than seven are worn at once. It serves as a ritual attribute for young men during the funeral rites of a family member and is worn until it breaks as a sign of respect. From an ethnosemantic perspective, the mna represents the values of respect, loyalty and emotional attachment to the family, whilst also affirming the role of young men in the funeral traditions of the Biak people; it has been in use since 1887. (Dimensions: 9.5 cm; Inventory number: RV-929-183; Image number on the website: 44; source: wereldmuseum).

15. Pam'e (Pam-e)

A fishing net made from rattan fiber, traditionally used by both men and women in shallow waters since before 1887. This tool serves to meet daily food needs and reflects shared participation in fishing activities. From an ethnosemantic perspective, the pam'e represents local knowledge of aquatic resources, traditional technical skills, and the value of social collaboration among the coastal communities of Biak. Dimensions: 300 cm; Inventory number: RV-602-41; Image number on the website: 24; source: wereldmuseum.

16. Samfar (Sam-far)

A traditional bracelet made from shell, serving as both an accessory and a means of barter and payment for a bride price. This object plays an important role in social and customary transactions. From an ethnosemantic perspective, the samfar symbolizes status, exchange value and the legitimacy of kinship ties. Dimensions: - ; Inventory number: RV-5230-2; Image sequence number on the website: 297; source: wereldmuseum.

17. Sarak (Sa-rak)

A brass bracelet crafted by Biak blacksmiths, serving as both a wrist ornament and a marker of cultural identity. From an ethnosemantic perspective, the sarak represents local craftsmanship and the traditional aesthetic values of the Biak people. (Dimensions: to fit the wrist; Inventory number: RV-09-370; Image sequence number on the website: 5; source: wereldmuseum).

18. Sekasas / Denem Romun (Se-ka-sas) / (De-nem- Ro-mun)

A traditional tool for catching sharks, made from wood, rattan, binding rope and coconut shells. This tool produces a sound to attract sharks to the water's surface so that they can be caught by fishermen. From an ethnosemantic perspective, the sekasas represents the ecological knowledge and traditional fishing techniques of coastal communities, as well as the harmonious relationship between humans and the marine environment prior to 1887. Dimensions: H 60 cm × W 48 cm; Inventory number: RV-929-508; Image sequence number on the website: 69; source: wereldmuseum.

19. Snefer (Sne-fer)

The bow of a traditional Biak boat is decorated with carvings such as famanggor, anfyanir/korwar statues, or other symbolic figures including praying mantises. As well as being a structural component that aids navigation, the snefer serves as a symbolic medium that affirms identity, spirituality and the connection to ancestors. From an ethnosemantic perspective, the snefer represents cosmology, kinship and the relationship between humans and nature as well as the spirit world, with its ornamentation interpreted as protection, guidance, courage and the continuity of the lineage within Biak's seafaring culture. Dimensions: 205×225×30 cm; Inventory number: RV-2401-3; Image sequence number on the website: 245; source: wereldmuseum).

20. Tobek / Denem Romun (To-bek) / (De-nem- Ro-mun)

A traditional tool used by fishermen to attract sharks, made from wood, rattan and coconut shells. Its primary function is to facilitate the capture of sharks. From an ethnosemantic perspective, the tobek reflects the local knowledge of coastal communities regarding marine ecology, fishing techniques, and the relationship between humans and the

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natural environment as a source of livelihood. Dimensions: 49 x 23 cm; Inventory number: RV-1528-383; Image sequence number on the website: 99; source: wereldmuseum).

Based on the descriptions of these 20 techno-factual lexical items, it can be concluded that techno-factual lexicon in Biak culture exhibits a close interconnection between the form of the artifact, its function, and the ethnosemantic meanings that have developed within community life. The form of the artifact indicates the material characteristics and construction of the object, whilst its function reveals how the artifact is used in the community's daily activities. Both of these aspects are further linked to the ethnosemantic meanings that reflect how the Biak community constructs and understands artifacts within the context of social and cultural life.

From the data as a whole, it is evident that the techno-factual lexicon functions not merely as a label or naming system for objects, but forms part of a knowledge system that connects objects to the community's daily practices. Artiefacts for protection, food processing, fishing, personal care, work, rituals, jewelry and maritime activities demonstrate that the community's experiences of the environment and their livelihood needs are embodied in artiefacts, which subsequently acquire specific names in the Biak language. The relationship between form and function illustrates that the lexical meaning of a technofact is understood within the context of its use, rather than solely on the basis of its material form.

These findings reinforce the view that language and material culture are inextricably linked: art iefacts are the concrete manifestation of cultural practices, whilst the lexicon serves as a linguistic representation that records the community's experiences and conceptions of these art ie facts. The results of this analysis subsequently form the basis for the discussion of the third objective, namely to uncover the cultural values and local knowledge systems contained within the Biak community's techno-factual lexicon.

IV. CONCLUSIONS

This study identified 20 techno-factual lexical items in Biak culture based on visual data from the Wereldmuseum collection, observations, and interviews with six native speakers of the Biak language. The findings reveal the diversity of artiefacts associated with various aspects of daily life among the Biak people.

This techno-factual lexicon encompasses artiefacts for protection, rituals, food processing, personal care, fishing, jewelry and traditional boats. The diversity of forms, materials and functions demonstrates that these artiefacts form part of the technology and daily practices of the Biak society.

Ethnosemantic analysis shows that the techno-lexicon not only serves to name objects but also represents the knowledge, values, identity and cultural experiences of the Biak community. Consequently, the documentation of the techno-lexicon is vital for supporting language preservation and the sustainability of the Biak community's knowledge and culture.

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