EMTEKA: Jurnal Pendidikan Matematika
Volume 6, No. 2, 2025. 636-650
DOI: https://doi.org/10.24127/emteka.v6i1.9652

e-ISSN 2746-5594
p-ISSN 2746-5608

EXPLORATION OF ETHNOMATEMATICS IN TRADITIONAL AGRICULTURAL TOOLS IN KUBU RAYA REGENCY

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Received 09 May 2025; Received in revised form 19 July, 2025; Accepted 30 August 2025

ABSTRACT
The abstract nature of mathematics poses a unique challenge for teachers in explaining mathematical concepts to students. In fact, many mathematical elements exist in everyday life that can be used as teaching aids for mathematics, one of which is the agricultural tools used by farmers in Kubu Raya Regency. Therefore, it is important to conduct research. This study aims to describe (1) traditional agricultural tools in Kubu Raya District and (2) mathematical concepts in the form of traditional agricultural tools in Kubu Raya District, West Kalimantan. This study employs a qualitative descriptive research method with an ethnographic approach. Data collection was conducted through interviews and documentation, with a total of three farmers in Kubu Raya District who are active users of traditional rice farming tools as research subjects. The results of the study indicate that: (1) The agricultural tools used by farmers include ani-ani, bakul, tampah, lumpang, and tongkat (alu), (2) The mathematical concepts found in traditional agricultural tools in Kubu Raya District include geometric two-dimensional shapes and three-dimensional shapes, as well as measurement concepts such as perimeter, area, and volume. From the results of this study, it is hoped that teachers can gain insights into developing contextual and culture-based mathematics materials, so that students can understand that mathematics is closely related to life and easy to learn.
Keywords: ethnomathematics; exploration; traditional farming tools.

ABSTRAK
Karakteristik matematika yang abstrak memberikan tantangan tersendiri bagi guru untuk menjelaskan materi matematika kepada peserta didik. Kenyataannya banyak unsur-unsur matematika yang ada di kehidupan sehari-hari yang dapat digunakan sebagai media pembelajaran matematika, salah satunya pada alat pertanian yang digunakan petani di Kabupaten Kubu Raaya. Sehingga penting untuk dilakukan penelitian. Penelitian ini bertujuan untuk mendeskripsikan (1) alat pertanian tradisional di Kabupaten Kubu Raya dan (2) konsep matematika pada bentuk alat pertanian tradisional di Kabupaten Kubu Raya, Kalimantan Barat. Penelitian ini menggunakan metode penelitian deskriptif kualitatif dengan pendekatan etnografi. Pengumpulan data dilakukan melalui wawancara dan dokumentasi, dengan jumlah subjek penelitian sebanyak 3 orang petani di Kabupaten Kubu Raya yang merupakan pengguna aktif alat pertanian tradisional padi. Hasil penelitian menunjukkan bahwa: (1) Alat pertanian yang digunakan petani yaitu ani-ani, bakul, tampah, lumpang dan tongkat (alu), (2) konsep matematika yang ditemukan pada alat pertanian tradisional di Kabupaten Kubu Raya meliputi bentuk geometri bangun datar dan bangun ruang, serta konsep pengukuran seperti keliling, luas, dan volume. Dari hasil penelitian ini, diharapkan dapat memberikan wawasan bagi guru dalam mengembangkan materi matematika secara kontekstual dan berbasis budaya, sehingga siswa dapat memahami bahwa matematika dekat dengan kehidupan dan mudah untuk dipelajari.
Kata kunci*:* alat pertanian tradisional ; eksplorasi; etnomatematika

e-ISSN 2746-5594
p-ISSN 2746-5608

Introduction

Mathematics is a basic subject taught to students in elementary school. Mathematics is often considered difficult and intimidating because it is perceived as abstract, full of formulas, and not directly related to everyday life. This makes students less motivated and learning less effective. Many recent studies have been conducted to address this issue. Anggraeni et al. (2024) also describe that mathematics education in elementary school aims to help students understand mathematical concepts, explain mathematical concepts, explain the relationships between various concepts, and apply mathematical concepts to solve problems. The ability of teachers to design effective and appropriate learning activities is a crucial component to ensure that these skills can be mastered by elementary school students.

One of them uses an ethnomathematics approach. Ethnomathematics is the linking of mathematics with local culture to make learning more enjoyable, meaningful, and easy to understand (Zaenuri et al., 2023). In line with this view, Abi (2017) defines ethnomathematics as a form of mathematics used by specific cultural groups. This enables the integration of mathematics into the mathematics curriculum and learning models that support mathematics learning.

The abstract nature of mathematics requires continuous learning from concrete to abstract levels. Concrete mathematics learning is used to explain mathematical concepts in a simple way at the elementary school level. This bridges students' understanding before moving on to abstract mathematics. The use of ethnomathematics is one method in this concrete learning process.

Rawani & Fitra (2022) state that ethnomathematics is a mathematics learning approach that integrates cultural elements. The realistic mathematics approach, which involves real-life activities and cultural elements, particularly the use of local languages, greatly assists students in understanding mathematical concepts. According to D'Ambrosio in Weniarni et al. (2022), ethnomathematics is a term derived from the word “ethno,” which relates to the culture and customs of a community, and “mathema,” which means understanding or engaging in thinking activities such as counting and measuring. This term was first introduced in 1977 by a Brazilian mathematician. In the modern era, approaches such as project-based learning are needed so that students can understand and appreciate the cultural diversity around them. According to Indrawati & Sari (2024), cultural heritage is important for local identity because it reflects the history, values, and way of life of a community. Additionally, cultural heritage can also be utilized to boost the local economy through tourism, crafts, and performing arts.

One study in dance art integrated with ethnomathematics, namely Melinda & Septianawati (2023), shows that the Dayak Totokng dance, a traditional dance that reflects respect for the pengayo and victims of kayo Singkawang, has a deep meaning. Within the dance, there are two-dimentions shapes such as triangles, parallelograms, and circles. This demonstrates that ethnomathematics encompasses a broad scope worthy of research and study.

The ethnomathematics approach emphasizes the importance of local culture in helping students understand mathematics. Traditional methods in daily life actually contain mathematical values, though these are often overlooked in formal education. By combining culture and mathematics, students can see that

e-ISSN 2746-5594
p-ISSN 2746-5608

mathematical concepts are closely related to their lives. This makes learning more meaningful, enjoyable, and easier to understand. Additionally, students become more creative and confident in solving problems within the context of their culture (Nurniyati et al., 2024).

Research on learning concepts in ethnomathematics has also been conducted by previous researchers. Mubarok (2025), in his research, mentioned that learning media using woven crafts received a good response because it facilitated the delivery of material, sharpened thinking skills, and made students more interested in learning mathematics. Susanti (2022) The use of ethnomathematics in this learning process can reveal that there are different ways of learning mathematics. This indicates that modifying learning media with the students' surrounding environment can make mathematics material more interesting.

Lidinillah et al (2025) conducted development research using picture storybooks containing ethnomathematics. The results of their research indicate that picture storybooks containing ethnomathematics are very valid and practical for fifth-grade elementary school students. The use of ethnomathematics in learning media provides students with a new experience that the things around them are related to learning.

In addition to learning media, ethnomathematics can also be integrated into the learning process. This research was conducted by Patimbangi & Darwis (2025) "The results of the study show that the developed model is effective in improving students' mathematics learning outcomes. In addition, the model successfully integrates Bugis cultural values into students' attitudes and behavior. The effectiveness of the model is evidenced by a validity and implementation rate of 85%, as well as a 20% improvement in students' learning outcomes after the model was implemented." In their research, the learning model developed by integrating Bugis cultural values into students' attitudes and behaviors demonstrated the model's effectiveness with a validity rate of 85% and a 20% improvement in students' learning outcomes.

Kubu Raya is a region in West Kalimantan that still has a fairly large agricultural area. For rural communities, farming has been a traditional livelihood passed down from generation to generation. Unbeknownst to them, mathematical concepts are integrated into agricultural activities and the tools used. Robinson et al. (2018) state that “Teachers, administrators, and curriculum designers can use the evaluative criteria created using the integrative agricultural education framework to purposefully and fluidly include mathematics and integrative teaching into agricultural education curriculums.” The integration of education within the educational framework can be designed within evaluation rubrics, administration, and curriculum design to serve as tools for integrating mathematics into teaching.

Traditional agricultural tools are increasingly rare as farmers switch to modern tools. However, modern tools can damage the environment. Traditional tools need to be preserved because they are environmentally friendly and part of a valuable culture. These tools are also easy to make, inexpensive, and made from natural materials. In addition, traditional tools have cultural value due to their unique shapes and social value, such as mutual cooperation during harvest time.

e-ISSN 2746-5594
p-ISSN 2746-5608

These tools also do not pollute the environment because they do not use machines or fuel.

Ethnomathematics shows that local mathematics exists in various cultures, including Indonesian culture. One cultural heritage that has been almost forgotten is the various traditional tools used in agriculture to plant rice. In fact, when studying and using traditional agricultural tools such as ani-ani, bakul, tampah, lumpang, and tongkat (alu), we are actually learning mathematics without realizing it. These tools have shapes and sizes related to elementary school mathematics lessons, such as two-dimensional and three-dimensional shapes.

Mathematics learning that varies from learning models to teaching media is an alternative modification of mathematics learning to achieve optimal results. In elementary school learning in particular, an in-depth analysis of students' abilities is needed so that a good learning approach can be implemented. According to the research findings of Haryadi et al. (2025), several factors contributing to low mathematical literacy among students include a lack of understanding of the language used in problems, as well as limited experience in connecting problems to real-world contexts. This highlights the importance of integrating mathematics education with real-world applications, enabling students to more easily grasp the context of the material being studied.

Research by Putra & Prasetyo (2022) shows that cultural practices enable the understanding of mathematical concepts in reality. In the context of ethnomathematics, mathematics learning plays an important role in improving students' understanding of mathematical concepts. This learning process should be linked to the culture that exists in the environment where students and schools are located. (Tlonaen & Deda, 2021) One solution to preserve regional culture is by integrating cultural elements into education, particularly mathematics education. One solution to preserve the culture that exists in each region is to introduce culture, especially mathematics education. On the other hand, the mathematical concepts discovered can be used to understand abstract mathematical concepts. Culture-based learning not only improves students' understanding of mathematics but also helps them appreciate their cultural heritage. This is in line with the objectives of the Merdeka Curriculum, which aims to develop not only cognitive but also affective aspects of students.

Previous studies have highlighted the importance of ethnomathematics education for students in understanding mathematical concepts. The cultural richness of each region serves as a valuable learning resource for students. Similarly, in Kubu Raya, it is important to explore the cultural values surrounding students so that they can be utilized as a medium for mathematics education. This study will explore mathematical concepts present in agricultural tools in Kubu Raya, enabling the development of teaching materials and appropriate learning models for use in schools. Specifically, for schools in the Kubu Raya area, where most of the region is agricultural, students can directly observe mathematical concepts in their surroundings.

In rice farming, the community uses various traditional tools that have been used for generations, such as ani-ani, bakul, tampah, and lumpang. These tools not only serve as agricultural equipment but also hold cultural value and incorporate mathematical concepts that can be explained through an ethnomathematics

e-ISSN 2746-5594
p-ISSN 2746-5608

approach. The preservation of these traditional tools is important as part of cultural heritage and as a contextual learning resource, particularly in mathematics education. These tools can serve as concrete examples that are easy for students to understand, especially for basic mathematics, which is often perceived as abstract.

The problem in this study is how the traditional agricultural tools used by the community in Kubu Raya are shaped and function, as well as how to explore the ethnomathematical concepts contained in these tools. Therefore, it is important to conduct a study titled "Exploration of Ethnomathematics in Traditional Agricultural Tools in Kubu Raya District."

Research Methods

This study uses a qualitative descriptive method with an ethnographic approach. According to Creswell & Creswell in Iswahyudi & Dkk 2023), qualitative research usually uses data collection techniques such as in-depth interviews, direct observation, or document analysis. According to Budiarto (2022), ethnography is a qualitative research approach that aims to study the culture of a community. This approach has several unique characteristics, including the full involvement of the researcher in the research, exploration of the culture of the community, and the need for in-depth data presentation. The ethnographic approach was chosen to enable a deeper understanding of the role of local culture in the use of traditional agricultural tools and its connection to the mathematical concepts contained therein.

Marlisa et al. (2024) state that ethnomathematics research in Indonesia has produced two complementary approaches: as a learning tool and as a research framework. The ethnomathematics learning approach aims to deepen students' understanding of mathematical concepts by linking them to elements of local culture, while the ethnomathematics research approach focuses on uncovering and describing mathematical concepts in various cultural practices.

The following research design was used in this study. Planning: at this stage, the focus of the research was determined. Traditional farming tools used by farmers in Kubu Raya that are integrated with mathematical elements are the focus of this research. Preparation, at this stage the research instruments used are developed. Data collection, conducting interviews with traditional farmers in Kubu Raya to obtain information and explanations about the traditional farming tools they use. Recording and taking written notes during the research. Descriptive data analysis, comprehensively understanding the research data and identifying patterns in the agricultural tools used. Ethnomathematical data analysis, linking the findings from the traditional agricultural tools used by farmers in Kubu Raya with the mathematical concepts taught in schools. Report Writing, Descriptive and interpretive writing of research results to describe ethnomathematics in traditional farming tools used by farmers in Kubui Raya.

This study used purposive sampling, with the characteristics of active farmers who use traditional farming tools and live in Kubu Raya. The participants were Mrs. Bariyah, Mrs. Surti, and Mrs. Sarini, who live in Rasau Jaya 2, Kubu Raya Regency. Data collection techniques used interviews, observation, and documentation, while the tools used were interview guidelines and observation sheets. Structured interviews were conducted to determine the functions and

e-ISSN 2746-5594
p-ISSN 2746-5608

methods of use of traditional agricultural tools. The interview instrument, in the form of interview guidelines, was designed with a grid in accordance with the research objectives. Non-participant observation was conducted to directly observe the use of these tools in the field. Observation sheets were used to obtain direct data on the traditional agricultural tools in question. Additionally, the researcher also conducted documentation in the form of photographs to reinforce the data obtained. These photographs will be analyzed to identify the mathematical elements contained within them. Interview Guidelines are shown in Table 1.

Table 1. Interview Guidelines

Aspect	Question
Types of Traditional Tools	What traditional farming tools do you use?
Function of Tools	What are the functions and uses of these tools in farming?
How to Use	How are these tools used?
Tool Materials	What materials are used to make the tool?
Tool Manufacturing	How is the tool manufactured?
Tool Shape	What is the shape and dimensions of the tool?
Tool Usage	When is the tool used in farming?
Cultural Value or Local Wisdom	Does the tool have cultural value or ancestral heritage?

Based on Table 1 by comparing the results of interviews, observations, and documentation to produce research results. Analyzing the results of interviews in accordance with the research objectives and comparing them with the results of field observations. The results of the documentation became the basis for determining the relationship of these agricultural tools with mathematics materials

Results and Discussion

Based on the data analysis that has been carried out, the results show that there are elements of ethnomathematics in traditional agricultural tools used by people in Kubu Raya Regency. The traditional agricultural tools used by the Kubu Raya community are Ani-ani, bakul, tampah, lumpang and tongkat *(alu)*. The following is an image of traditional agricultural tools in Kubu Raya.

Traditional Agricultural Tools

In Kubu Raya Regency, people still use many traditional tools in farming and processing crops. Some tools that are often used are ani-ani, baskets, tampah, lumpang and sticks *(alu)*. The following is an explanation of these traditional agricultural tools.

Ani-ani

Ani-ani is a cutting tool that resembles a knife, where the sharp part is mounted on a small board. This board is equipped with a vertical handle that runs across the center. Generally, the handle is made of bamboo with a diameter of about 2.5 to 3 cm and a pointed bottom. The length of the handle is around 15 cm.

e-ISSN 2746-5594
p-ISSN 2746-5608

The board on which the knife blade is attached measures about 5 cm to 10 cm and is no more than 1 cm thick. The knife blade itself has a size of about 1.5 cm 8 cm. A picture of ani-ani can be seen in Figure 1 below.

Figure 1. Ani-ani

Based on Figure 1 how to use ani-ani is done with a special hand position to be comfortable when harvesting rice. First, three fingers of the right hand, namely the little, ring and middle fingers, are placed at the bottom of the ani-ani handle (stalk). Then, the thumb is placed on the upper right side of the handle, and the index finger is on the upper left side of the handle. Thus, the ani-ani handle is clamped and controlled with five fingers. After that, the left hand is used to reach or grasp the rice clump. Meanwhile, the right hand holding the ani-ani is used to cut the rice stalks under the grip of the left hand.

Bakul

Bakul is a traditional container used to carry rice after it has been harvested using ani-ani. It is made of woven bamboo that is neatly woven to form a strong and easy-to-carry container. The bottom of the basket is square with a size of 40 cm 40 cm, while the height of the basket reaches 45 cm. At the top, the basket is round like a circle with a diameter of about 40 cm, so its radius is 20 cm. The basket does not have a lid so that the paddy can be inserted easily from the top. The walls of the basket follow the shape and widen upwards, with a width of about 32 cm. This kind of basket is commonly used by the community when harvesting rice or carrying other agricultural products because it is practical and made from bamboo which is easily found in the surrounding environment. A picture of Bakul can be seen in Figure 2 below.

Figure 2. Bakul

Tampah

Tampah is a traditional tool used to clean paddy or rice after the milling process. It helps separate the remaining grain husk from the clean rice. Tampahs are made of tightly woven bamboo that is strong enough to hold the rice grains when winnowed. The shape of the tampah is circular, and usually has a diagonal size of about 60 cm as shown in Figure 3. Because it is round, the diameter is also 60 cm, so the radius is 30 cm (because the radius is half of the diameter). A picture of Tampah can be seen in Figure 3 below.

EMTEKA: Jurnal Pendidikan Matematika
Volume 6, No. 2, 2025. 636-650
DOI: https://doi.org/10.24127/emteka.v6i1.9652
e-ISSN 2746-5594
p-ISSN 2746-5608

Figure 3. Tampah

How to use the tampah starts after the rice is harvested and dried in the sun, then the winnowing process is carried out. How to use the tampah is done by holding both sides of the tampah using both hands, namely the right hand holding the right side and the left hand holding the left side of the tampah. The tampah is then shaken back and forth slowly and repeatedly. This movement causes the husk or light impurities to be lifted up and carried away by the wind, while the heavier paddy or rice remains inside the tampah. Sometimes, the tampah can also be moved up and down slightly or thrown gently upwards, so that the impurities can be separated more easily. During this process, the body position is usually half-bent, and the tampah is held at a slight angle so that the impurities can be pushed to the front and out of the tampah.

Lumpang dan Tongkat

Lumpang and Tongkat *(alu)*. are two traditional tools used by people in Kubu Raya as an inseparable pair. Lumpang serves as a container, while tongkat *(alu)*. as a complementary tool. Both need each other in their existence as shown in Figure 4. Lumpang used in this area generally has a length of 55 cm, height of 25 cm, width of 25 cm, and a hole diameter of about 18 cm. Meanwhile, *tongkat (alu)*. measures 160 cm in length and 5 cm in width. Both are made of sturdy and durable wood. This tool is part of the tradition of the Kubu Raya community which is still maintained today. A picture of Lumpang and Tongkat can be seen in Figure 4 below.

Figure 4. Lumpang and Tongkat *(alu)*

How to use Lumpang and Tongkat *(alu)*. begins after the rice is winnowed and separated from empty or unfilled grain. After the winnowing process, the clean rice is put into lumpang to taste. Then, tongkat *(alu)* is used to pound the rice repeatedly using human labor. This pounding aims to separate the rice skin (husk) from the contents. After the pounding process is complete, the results are sifted or winnowed again to separate the husks from the rice. This process can be repeated several times until clean and ready-to-use rice is obtained.

Ethnomathematics in Traditional Agricultural Tools

Flat Buildings

Flat shapes are two-dimensional geometric objects composed of points, lines and angles. These shapes can be triangles, squares, rectangles, circles,

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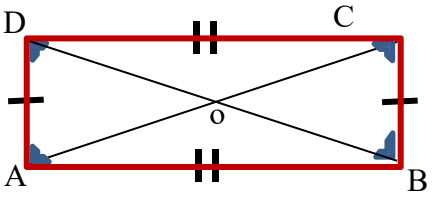
p-ISSN 2746-5608

trapezoids, and jajargenjang (Rais, 2025.). A picture of Ani-ani farming tools can be seen in Figure 5a and 5b below.

Gambar 5a. Alat Pertanian Ani-ani



Gambar 5b. Pemodelan dan Konsep persegi panjang pada permukaan ani-ani

After looking at Figure 5b, we can conclude that the ani-ani farming tool has a flat shape. That flat shape is a rectangle. The following are some properties of rectangles that researchers found on the shape of ani-ani.

- O is the center point of the rectangle
- Has 4 sides, namely sides AB, BC, CD, and DA
- The opposite sides are parallel (AB/CD and BC//DA)
- Facing sides are equal in length (AB CD and BC DA)
- Each corner is equal
- The diagonals are equal in length

The diagonals intersect and bisect each other (AO OC BO OD)
With the formula:
Calculate the area of a rectangle $L = p \times l$
Calculating the perimeter of a rectangle is $K = 2 \times (p + l)$. A picture of Bakul Farming Tools can be seen in Figure 6a below.

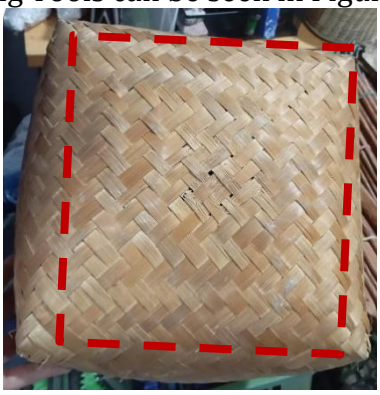


Figure 6a. Bakul farming tool

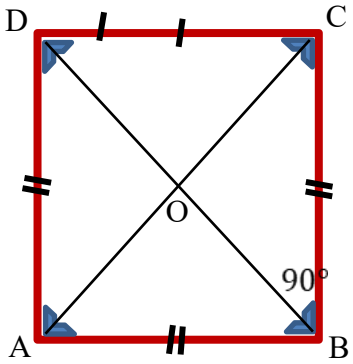


Figure 6b. Modeling and Square concept on the surface of the basket

EMTEKA: Jurnal Pendidikan Matematika
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e-ISSN 2746-5594
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Based on the observation of Figure 6b, it is known that the basket has a square flat shape. This shape is characterized by its equal-length sides and corners that form right angles. These characteristics are in accordance with the properties of a square found by researchers on the basket object.

- O is the center point of the square
- All four sides of a square are equal in length (AB BC CD DA)
- The opposite sides of the square are parallel (AB/CD and BC//DA)
- Every angle is equal
- Diagonals are equal in length
- The diagonals are perpendicular and bisect each other (AO OC BO OD)

With the formula:

Calculating the area of a square $L = s \times s$

Calculating the perimeter of a square is $K = 4 \times s$. A picture of tampah farming tool can be seen in Figure 7a below.

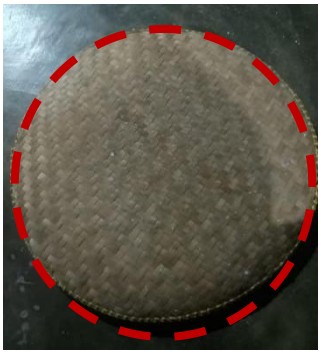
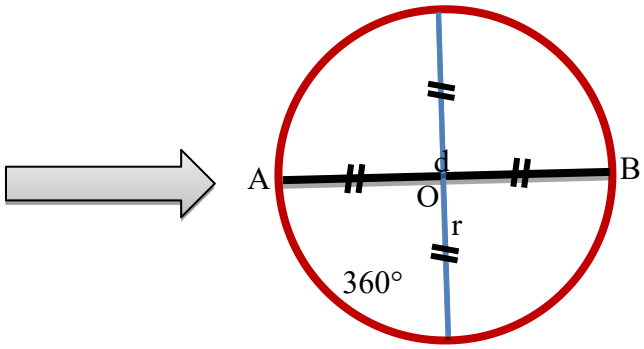


Figure 7a. Tampah Farming Tool Figure



7b. Modeling and Concept of circles on the surface of the Tampah

In Figure 7b, the tampah appears to have a flat circular shape. This can be seen from the edges that form a perfect curve without corners. Researchers noted that the tampah has the characteristics of a circle, such as having a center point, aradius that connects the center with the edge, and a diameter that divides the tampah into two equal parts. The following describes the properties of a circle.

- Point O is the center of the circle
- AB is the diameter of the circle with the symbol d
- OA = OB is the radius of the circle that is with the symbol r
- AB = OA + OB

With the formula:

- Area of a circle:

If the radius (r) is known: $L = \pi r^2$

If the diameter (d) is known: $L = \frac{\pi d^2}{4}$

Circumference of a circle:

If the radius (r) is known: $K = 2\pi r$

If the diameter (d) is known: $K = \pi d$. A picture of agricultural tool can be seen in Figure 8a below.

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Figure 8a. Agricultural tool mortar

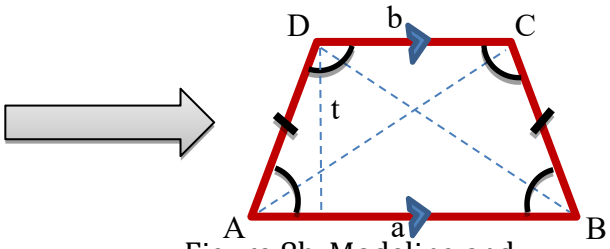

Figure 8b. Modeling and Concept of isosceles trapezoid on the surface of the mortar

Based on the observation in Figure 8b, the mortar has the shape of an isosceles trapezoid. This shape is characterized by a pair of parallel sides and two hypotenuse of equal length. The angles on the legs of the trapezoid are also equal, and the top and bottom of the mortar are different in length. Here are the properties of an isosceles trapezoid as seen in the mortar.

- Has a pair of opposite and parallel sides (DC//AB)
- Has equal side lengths (AD=BC)
- Has two equal base angles
- Has two angles on the top side that are equal
- Has two diagonals of equal length, namely AC and BD

With the formula:

Calculating the area of an isosceles trapezoid is $L = \frac{1}{2}(a + b) \times t$

Calculating the perimeter of a square is $K = AB + BC + CD + DA$

Building Space

Spaces are three-dimensional shapes, having volume/fill. This shape is limited by points on its surface and has a surface area and volume. Spaces are divided into two, namely flat-sided spaces and curved-sided spaces. Flat-sided shapes have straight sides, for example cubes, blocks, prisms and pyramids. Meanwhile, curved-sided spaces have curved sides, such as tubes, cones, and spheres (Toybah et al., 2020). A picture of agricultural tool can be seen in Figure 9a below.

Figure 9a. Agricultural tool stick *(pestle)*

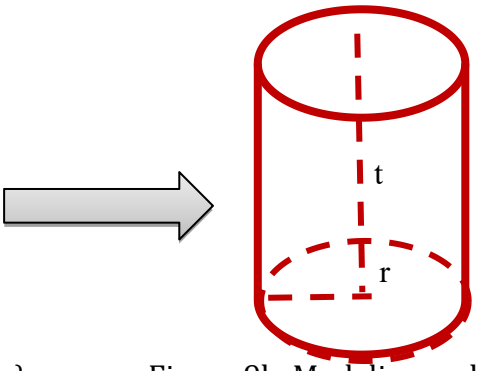

Figure 9b. Modeling and Concept of tube on surface of the Stick *(pestle)*

e-ISSN 2746-5594
p-ISSN 2746-5608

After looking at Figure 9b, it can be concluded that the Tongkat *(pestle)* agricultural tool has a spatial shape. That shape is a tube. The following are some elements of the tube found on the shape of the Stick *(pestle)*.

- The tube has 3 sides, namely the base side, the top side and the tube blanket.
- The tube has 2 ribs in the form of 2 circles, namely the base side and the top side of the tube.
- The height of a tube is the distance between the base and the top of the tube.
- The radius of the tube is the radius of the circle at the base of the tube
- The diameter of the tube is the diameter of the circle at the base of the tube

With the formula:

Calculating the surface area of a tube $L = 2 \times \pi \times r \times (r + t)$

Calculating the surface volume of the tube $V = \pi \times r^2 \times t$

Utilization of Ethnomathematics as Contextual Media in the Classroom

Ethnomathematics learning on traditional agricultural tools not only serves to introduce local culture to students, but can also be utilized as a contextual learning medium in the classroom. This approach, helps students can more easily understand mathematical concepts by linking real objects in the environment around them, such as ani-ani, bakul, tampah, lumpang and tongkat *(alu)*. Meanwhile, according to research conducted by (Zakiah et al., 2023), showing the process of planting rice there are activities that have mathematical elements in geometry material, namely in the process of making lines for planting rice. This is in line with the research of Septia, T. et al. (2024), In rice planting activities, there are mathematical activities that arise, namely counting, measuring, and calculating activities.

Meanwhile, in this study, the mathematical elements that appear in the field of geometry are rectangular ani-ani, square bakul, circular tampahs, and trapezoid-shaped lumpang. From these tools, students can learn about flat shapes, such as recognizing sides, angles, and calculating area and perimeter. Because these tools are in the surrounding environment, students understand more quickly because they immediately see examples. Robinson et al. (2018), said an integrative agricultural education framework was developed and used to design curriculum design as a tool to build mathematics teaching. The resources around students, in this case agriculture, can be used as a source in developing mathematics curriculum.

Maghfiroh et al. (2025), also found the use of geometry concepts of patterns and shapes in his research on the shape of the building of Dewi Kwam Im and Tie Kong temples in Gunung Kawi Pesarean. The results of his research concluded a great opportunity for teachers to link geometry material with a real local cultural context and easily recognized by students. Thus, mathematics learning can be contextualized in everyday life, making it more interesting, relevant, and easy to understand. This approach also contributes to increasing students' learning motivation because the material is no longer abstract, but is directly related to the surrounding environment and culture.

In contrast to Putri Octa Ardilla & Gusniawati (2025), who used historical objects in the Airlangga Museum to describe the basic concepts of mathematics. So diverse

e-ISSN 2746-5594
p-ISSN 2746-5608

are the efforts of researchers in finding ways to make it easier for students to understand mathematical concepts, especially basic concepts that are the foundation of students' initial abilities.

Another study conducted by (Zainuddin et al., 2022), the research findings show that the Madurese community has applied a number of mathematical principles in carrying out measurement activities and in the use of measuring units. Ethnomathematics studies in mathematics learning, complementing mathematics material, providing materials or tools to support the achievement of the objectives of mathematics material, planning learning activities, as a reference for policy makers in making decisions related to the mathematics learning process. Teacher can also utilize local cultural media in learning by using project-based learning media or field activities that integrate traditional agricultural tools into mathematics learning.

Previous research that has been done strengthens the results of this study. In terms of cultural studies conducted there is a link to mathematics material. Whether it is in places of worship, museums, community habits, and in this study it is related to the use of traditional tools used by farmers. This can be a foundation for other researchers in developing a culture around students to help students in learning mathematics. In addition, there is also a tongkat *(alu)* that is shaped like a tube. From here, students learn about building space and also about measurement, such as how to calculate volume. By directly measuring these tools, students can learn math in real terms and not just imagine. This makes the lesson more interesting and easy to understand, because math feels close to their lives. The use of ethnomathematics in learning can increase students' mathematical literacy, this is because students are given concrete examples to be able to understand more abstract mathematical concepts, such as algebra or advanced geometry. For example, after learning about flat shapes from agricultural tools, students can continue by working on problems that involve higher mathematical concepts.

The results of this study illustrate that the environment around students can be a resource for them. Learning that is close to students can make it easier for students to understand mathematics material. Although not all materials, the basic materials that students need to understand through the environment around students need further consideration.

Conclusion and Suggestion

Based on the results of the research that has been conducted, it can be concluded that traditional agricultural tools in Kubu Raya Regency that are often used are Ani-ani, bakul, tampah, lumpang and tongkat *(alu)*. Traditional agricultural tools used contain mathematical concepts. Some of the math concepts found include geometric shapes in flat and spatial shapes, as well as measurement concepts such as perimeter, area, and volume. This concept shows that math is not only in textbooks, but can also be found in everyday life, especially in the tools used by ancient farmers.

This finding illustrates that people have been using math for generations even though they do not directly call it math. This can be a clear example that math is close to people's lives and not always difficult as imagined. Knowledge like this can help students understand math in a more fun and meaningful way.

e-ISSN 2746-5594
p-ISSN 2746-5608

Based on the results of this study, researchers hope that the mathematical concepts in traditional agricultural tools can be utilized in learning. Further research can be done by compiling a structured learning media related to this traditional agricultural tool, so that it can be used by teachers in classroom learning.

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