



Paper-cutting art of Zhangpu, Fujian in the art of Buddhist statues , application and re-invention in the context of contemporary social

Baoli Cui

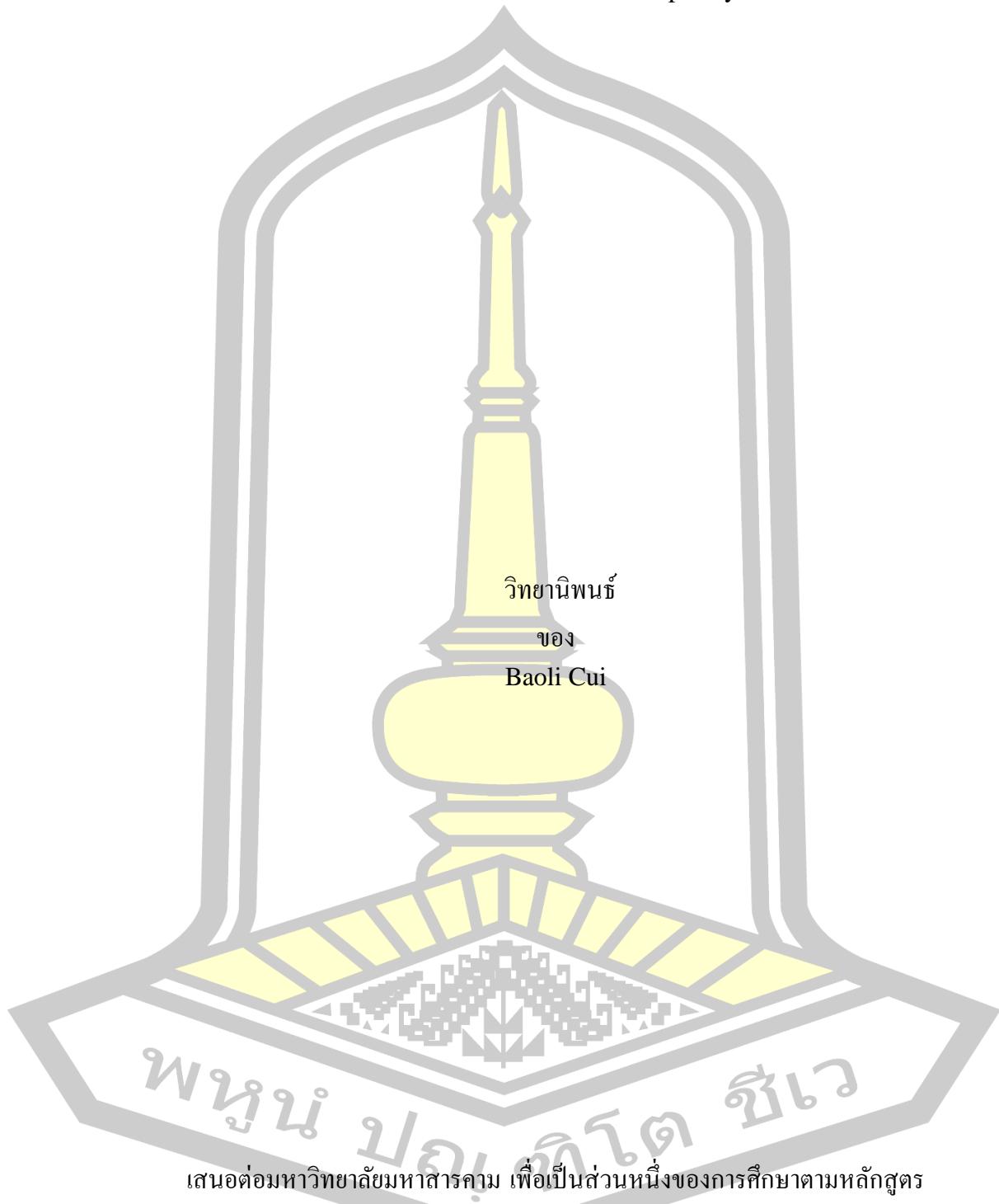
วิจัย
A Thesis Submitted in Partial Fulfillment of Requirements for

degree of Doctor of Philosophy in Fine and Applied Arts Research and Creation

August 2024

Copyright of Mahasarakham University

Paper-cutting art of Zhangpu, Fujian in the art of Buddhist statues , application and re-invention in the context of contemporary social

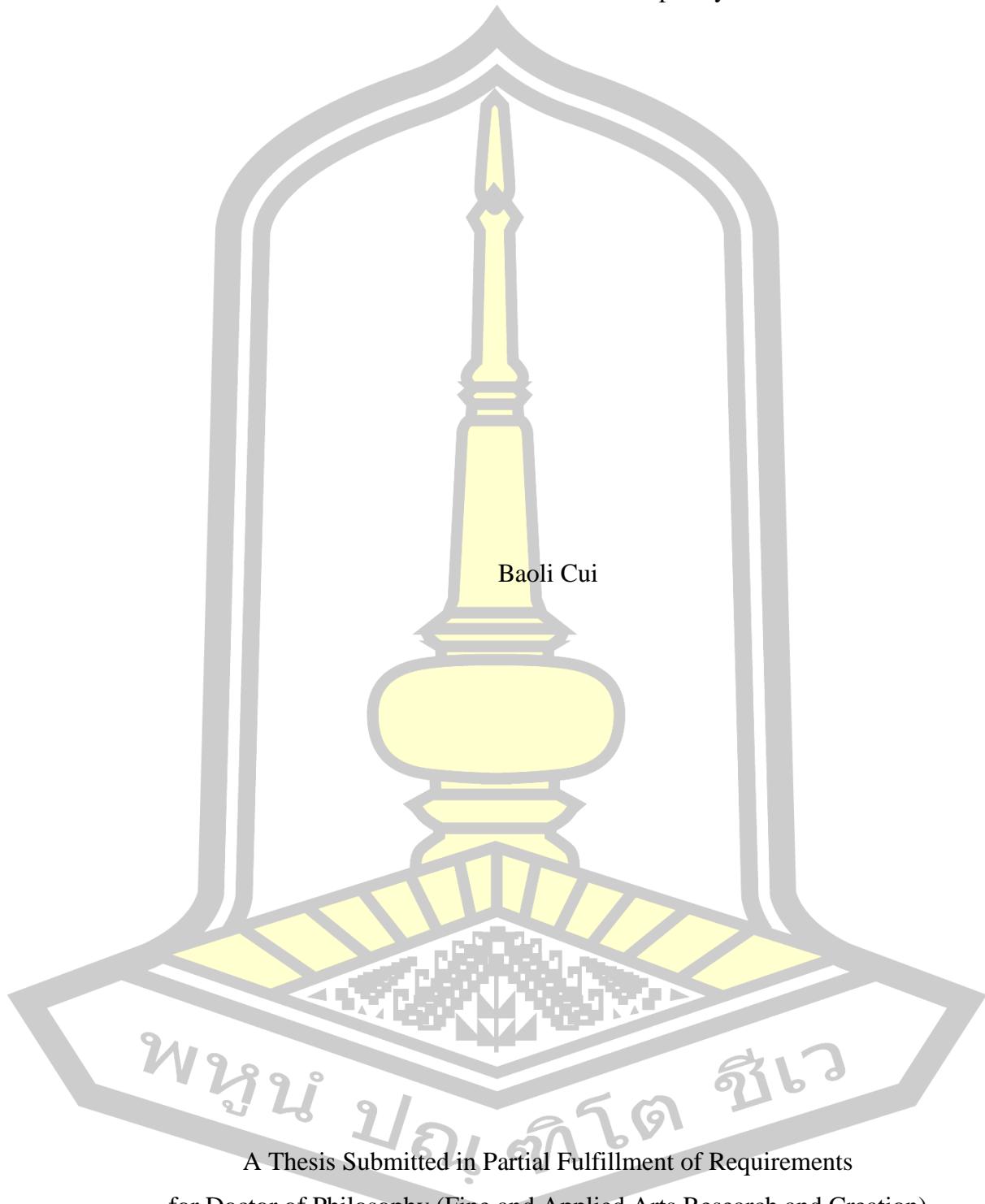


เสนอต่อมหาวิทยาลัยมหาสารคาม เพื่อเป็นส่วนหนึ่งของการศึกษาตามหลักสูตร
ปริญญาปรัชญาดุษฎีบัณฑิต สาขาวิชาการวิจัยและสร้างสรรค์คิดปักรัมภศาสตร์

สิงหาคม 2567

ลิขสิทธิ์เป็นของมหาวิทยาลัยมหาสารคาม

Paper-cutting art of Zhangpu, Fujian in the art of Buddhist statues , application and re-invention in the context of contemporary social



August 2024

Copyright of Mahasarakham University



The examining committee has unanimously approved this Thesis, submitted by Mr. Baoli Cui , as a partial fulfillment of the requirements for the Doctor of Philosophy Fine and Applied Arts Research and Creation at Mahasarakham University

Examining Committee

Chairman

(Assoc. Prof. Niyom
Wongphongkham , Ph.D.)

Advisor

(Asst. Prof. Vuthipong
Roadkasamsri , Ph.D.)

Committee

(Asst. Prof. Metta Sirisuk , Ph.D.)

Committee

(Assoc. Prof. Suebsiri Saelee ,
Ph.D.)

Committee

(Assoc. Prof. Arkom Sa-
Ngiamviboon , Ph.D.)

Mahasarakham University has granted approval to accept this Thesis as a partial fulfillment of the requirements for the Doctor of Philosophy Fine and Applied Arts Research and Creation

(Asst. Prof. Peera Phanlukthao , Ph.D.) (Assoc. Prof. krit Krit Chaimoon , Ph.D.)
Dean of Faculty of Fine - Applied Arts Dean of Graduate School
and Cultural Science

TITLE	Paper-cutting art of Zhangpu, Fujian in the art of Buddhist statues , application and re-invention in the context of contemporary social		
AUTHOR	Baoli Cui		
ADVISORS	Assistant Professor Vuthipong Roadkasamsri , Ph.D.		
DEGREE	Doctor of Philosophy	MAJOR	Fine and Applied Arts Research and Creation
UNIVERSITY	Mahasarakham University	YEAR	2024

ABSTRACT

Zhangpu paper-cut art is the representative of South China paper-cut art, which not only reflects the uniqueness of local culture, but also shows the artist's deep understanding and re-creation of the beauty of nature and life, providing a valuable perspective for the study of the culture of various regions in China. The purpose of this study is to study the paper-cut art in Zhangpu County, Zhangzhou City, Fujian Province, China. This study has the following three important objectives. 1. Research on Zhangpu community assets. 2. Study the papermaking materials and production process reflecting Zhangpu culture. 3. Create paper-cut works representing Zhangpu culture. This study adopts a mixed research method, including qualitative and quantitative research. The research data were collected mainly through fieldwork and literature research. Through the concept of humanities and social science, the main concepts include: community capital, local wisdom, cultural capital, innovation and so on. The results are presented in the form of descriptive analysis and experiments. At the same time, the works are presented through the participatory creation in the participatory research method, with experimental photos and research ideas. The main research groups and samples include: 1. Paper cutting artisans in Zhangpu County, Fujian Province. 2. Staff of government departments related to culture and art in Zhangpu County, Fujian Province. 3. Local life of ordinary residents of Zhangpu County, Fujian Province. 4. Some relevant scholars who have studied paper cutting in Zhangpu, Fujian Province.

The research results of this study, through literature reading and interview, collected and sorted out the local wisdom contained in Zhangpu paper-cut art. Through the collection and analysis of the receipts of the research samples in the form of questionnaires, the representative community capital in Zhangpu area of Fujian Province was selected, with the highest score and the most representative. Including: intangible cultural assets, Kaizhang Sacred King Sacrifice ceremony (average 4.5 points), Zhangpu puppet art (average 4.0 points) two items. Material and cultural assets, West Lake Park (average 4.5 points), Wushi Mazu Temple (average 4.0 points) two items. Natural assets, Qurey Coastal Scenic Area (average score 4.0). There are five items in total.

Paper making experiments of kelp, laver, kelp mixed bamboo and laver mixed bamboo were also carried out by questionnaire and experiment participation. Three paper making methods of kelp and laver were tried respectively, LeafSheet, CrushedLeaves and BoilthePulp. Finally concluded that the paper made of kelp and laver is not suitable for paper cutting because of its weak toughness and easy to break. According to different mixing ratios, the experiments of 20 groups were carried out, and the final conclusion was that the paper integrated with bamboo increased the toughness and enriched the texture effect, which was suitable for paper cutting. Among them, according to expert evaluation, the paper made of a mixture of seaweed and bamboo in a ratio of 90% to 10% is the most suitable.

Through participatory creation, five representative community capital items in Goal 1 are designed and conceived. Using the mixed materials of laver and bamboo produced in Goal 2 to produce paper, I created five paper-cut works containing the assets of Zhangpu community from the aspects of material, content and design. These five works are entirely from Zhangpu, with strong representation. It lays a foundation for the research on the integration of community assets and paper-cut art.

In summary, community assets are a collection of various resources, capabilities, and strengths within a community that can be mobilized to improve community life and solve community problems. In this study, by digging and using the community capital of Zhangpu area, and then using the advantages of community capital, the innovation of Zhangpu paper cutting based on community capital is completed, breaking the innovation of traditional thought. Adds a new perspective. Focus on the positive aspects of the community, not just its problems and needs. The identification and effective use of these assets can help the community develop itself, improve the quality of life of residents, solve the problems existing in the community, and complete the innovation of the community.

Keyword : Zhangpu paper-cut, community capital, papermaking, local wisdom

ພ້ອນ ປັນ ດີໂຕ ຂ່າວ

ACKNOWLEDGEMENTS

First of all, I would like to express my feelings about this academic journey. The three-year doctoral research career is not only the pursuit of knowledge, but also the process of self-growth and realization. On this road, I experienced numerous challenges and failures, but each fall became my motivation to move forward. I feel extremely proud to be standing at this moment of completion of my studies, which marks the end of one stage and also heralds a new beginning.

I sincerely thank my mentor, Dr. VuthipongRoadkasamsri. I will never forget your patient online guidance to me during the epidemic. After the epidemic, you took me with field investigation and taught me the experiment of papermaking. You have not only given me unselfish guidance in academia, but also care and support in life. Your wisdom and guidance will always be a valuable asset in my career. At the same time, I would also like to thank every member of the tutor group, whose advice and help were essential for me to complete my doctoral thesis. In addition, I would like to thank Zeng Fangfang, Lu Shurong, Chen Yanrong and Li Xiaoyan, four teachers from Zhangpu County, Fujian Province, for their support and help in field research, as well as all the people who have supported and helped me, including my family, friends and peers. Without your encouragement and help, I could not have completed this academic journey.

Looking forward to the future, I will continue to devote myself to the research of Zhangpu paper-cut art, hoping to make my own contribution to this field. I plan to apply the knowledge and skills I learned during my doctoral studies to practice, solve more practical problems, and devote myself to transforming scientific research results into a driving force for the sustainable development of society. As a new generation of scholars about to enter the society, I know that the academic road is endless, so I will continue to pursue the depth and breadth of academics, keep learning, and actively participate in international academic exchanges, with a view to becoming an influential scholar in my research field in the future career. Thanks again to all the people who accompany me growing up, your support is my most valuable wealth.

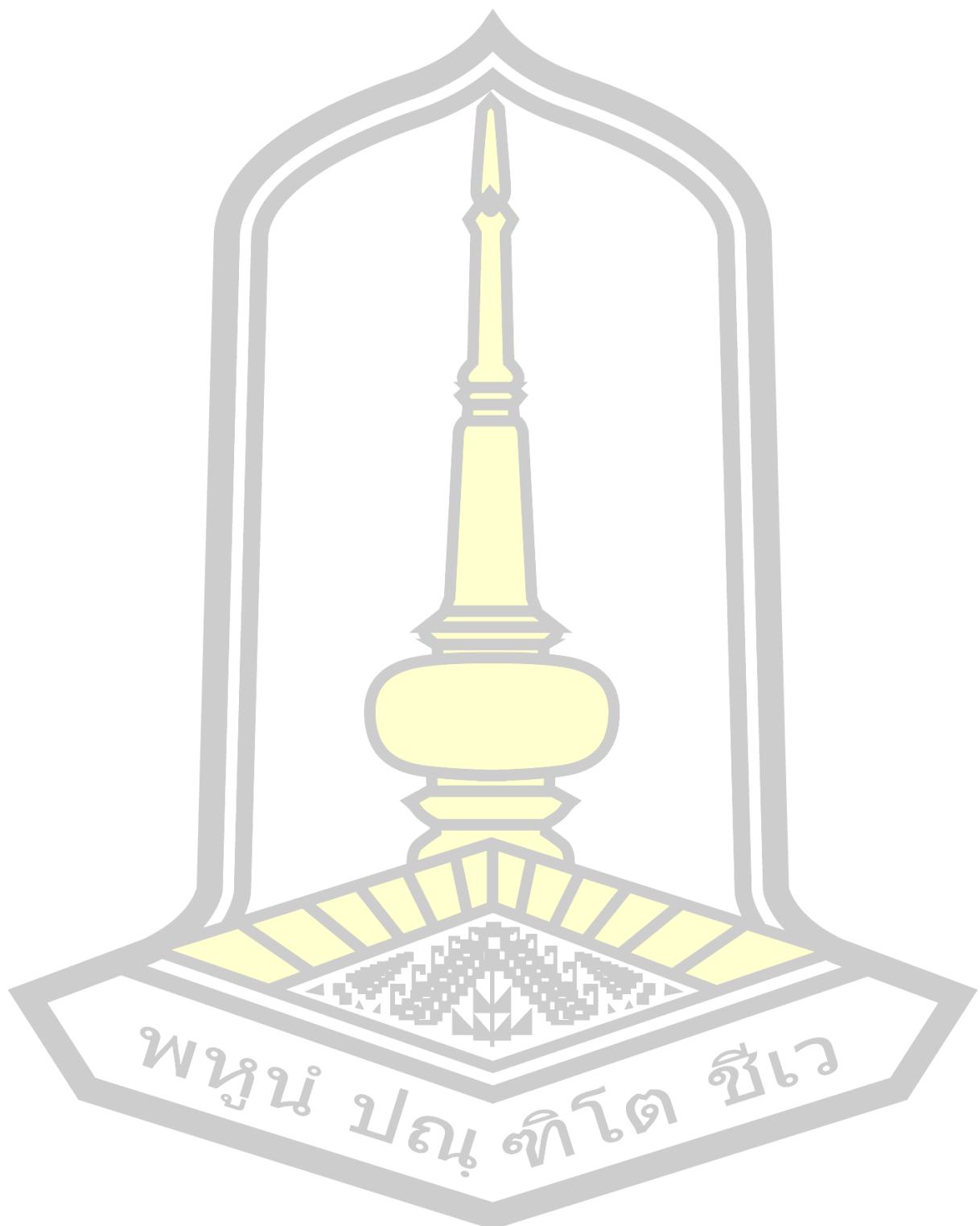


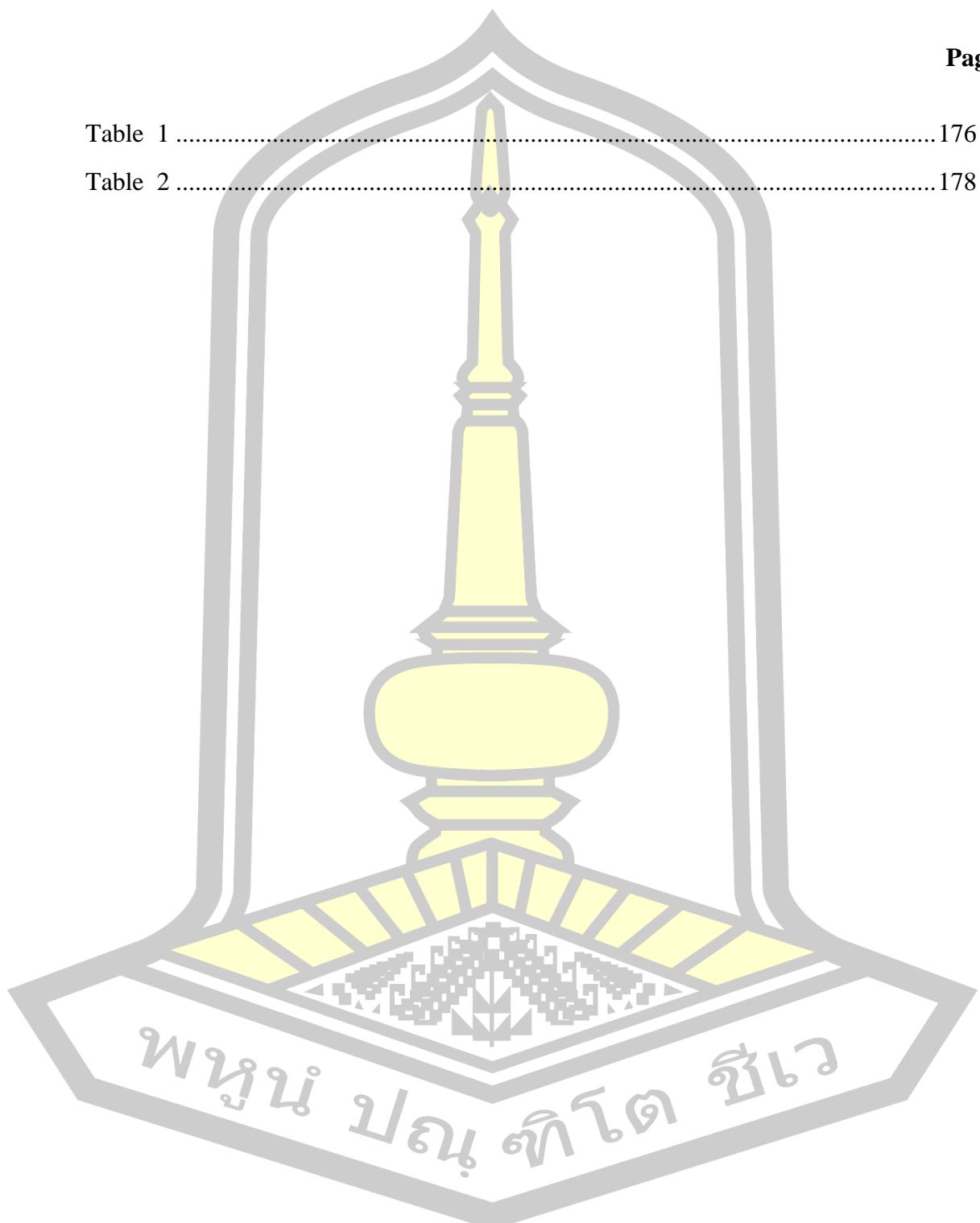
TABLE OF CONTENTS

	Page
ABSTRACT	D
ACKNOWLEDGEMENTS	F
TABLE OF CONTENTS	H
LIST OF TABLES	J
LIST OF FIGURES	K
CHAPTER I	20
Introduction	20
1.1 Background of Research	20
1.2 Purpose of the Research	25
1.3 Research Questions	25
1.4 Definition of Terms	25
1.5 Scope of Research	28
1.6 Research Methodology	29
1.7 Literature review	31
1.8 Concept, Theory and Conceptual framework	33
1.9 Research structure and Benefit of Research	35
CHAPTER II	37
Local wisdom in the art of Zhangpu paper-cutting	37
2.1 History and geographical location of Zhangpu	38
2.2 The development of Zhangpu paper-cutting and the development of local wisdom	40
2.3 The creative process and techniques of Zhangpu paper-cutting	44
2.4 The artistic characteristics and cultural connotation of Zhangpu paper-cutting	48
2.5 A summary of the value of Zhangpu paper-cutting and local wisdom	58
CHAPTER III	68
Summarization of community assets in Zhangpu County	68

3.1 Cultural assets of Zhangpu County.....	68
3.2 Material and cultural assets of Zhangpu County	77
3.3 Natural resource assets of Zhangpu County	86
3.4 Summary of Community Capital.....	90
3.5 Conclusion	93
CHAPTER IV	95
Research on papermaking materials and techniques in Zhangpu County	95
4.1 Overview and steps of papermaking.....	95
4.3 Papermaking experiments.....	117
Conclusion	132
4.4 Expert test feedback.....	180
CHAPTER V	183
Pattern design and production of representative paper-cut works of Zhangpu community assets	183
5.1 Inspiration and research	183
5.2 Ideation and sketching	184
5.3 Feedback adjustments	190
5.4 Refine the design	191
5.5 Paper-cut production.....	198
5.6 Paper-cut works display.....	199
CHAPTER VI	200
Research Summary Discussion And Suggestions.....	200
6.1 Research Summary	200
6.2 Discussion	202
6.3 Suggestions	205
REFERENCES	207
BIOGRAPHY	214

LIST OF TABLES

	Page
Table 1	176
Table 2	178



LIST OF FIGURES

	Page
Figure 1 Conceptual framework	35
Figure 2 Paper cutting tools commonly used, including: scissors, carving knife, utility knife, cushion plate	45
Figure 3 Paper	45
Figure 4 Chen Jin's paper-cut "Dragon Boat Race"	51
Figure 5 Chen Jin's paper-cut work "Another harvest Year"	51
Figure 6 Lin Tao's paper-cut work "Catching Fish"	52
Figure 7 Lin Tao's paper-cut work "Catching Shrimp"	52
Figure 8 It's a paper-cut by flavin called "Hat brim Flower"	53
Figure 9 The paper-cut work "Cake Flower" by flavin.	54
Figure 10 Flavin's paper-cut work "Harvest".....	55
Figure 11 Flavin's paper-cut work "My family's cattle"	55
Figure 12 Chen Qiuri's paper-cut "One Hundred Cats".....	56
Figure 13 Chen Qiuri's paper-cut "Octopus"	56
Figure 14 Gao Shaoping's paper-cut work "Double phoenix Peony"	57
Figure 15 Zhang Zhengrong's paper-cut works "Mandance to welcome the Fifteenth National Congress"	57
Figure 16 Ouyang Yanjun's paper-cut works "Tiger Tiger Alive"	58
Figure 17 lune	61
Figure 18 Sawtooth cutting.....	62
Figure 19 Round grain	62
Figure 20 Moire	63
Figure 21 Water pattern	64
Figure 22 Willow leaf pattern	65
Figure 23 The Torch Holding Festival.....	70
Figure 24 Dragon dance.....	71

Figure 25 trance	71
Figure 26 Temple fair	72
Figure 27 trance	73
Figure 28 The Hungry Ghost Festival	74
Figure 29 Worship of the Lord of Heaven	74
Figure 30 The worship of the Lord of Heaven	75
Figure 31 Turtle birthday cake	75
Figure 32 Bamboo horse drama	76
Figure 33 The puppet art in Zhangpu	76
Figure 34 Chaozhou Opera	77
Figure 35 The Zhangpu Confucian Temple	78
Figure 36 Yianbao	78
Figure 37 Zhaojiapu	79
Figure 38 Lantingzhen Mansion	80
Figure 39 Zhangpu Red Building	81
Figure 40 Liuao Ancient City	81
Figure 41 Sanguan Emperor Temple	82
Figure 42 Weihui Temple	82
Figure 43 Wushi Mazu Temple	83
Figure 44 Zhangzhou Binhai Volcanic National Geopark	84
Figure 45 Zhangpu Flower Expo Park	84
Figure 46 Figure West Lake Park	85
Figure 47 The Tea Expo Park	86
Figure 48 Zhangpu geographical location	88
Figure 49 Gu lei map	88
Figure 50 Gulei coastal scenic tourist area	89
Figure 51 Abstract Gallery tour area	89
Figure 52 Linjin Island Coastal Volcanic scenic spot	90
Figure 53 Representative statistics of intangible cultural heritage	92

Figure 54 Representative statistics of material and cultural assets	93
Figure 55 Representative statistics on natural assets	93
Figure 56 Collecting sugarcane leaves	96
Figure 57 Tutor picks leaves	97
Figure 58 Tutor picks leaves	97
Figure 59 Tutor picks leaves	98
Figure 60 Wash soak	98
Figure 61 Add caustic soda and start heating	99
Figure 62 How the leaves change during heating	99
Figure 63 Water gun	100
Figure 64 High pressure washing	101
Figure 65 High pressure washing	101
Figure 66 Rinse and filter to obtain pulp	101
Figure 67 Put the pulp into a basin filled with water	102
Figure 68 Even stirring	102
Figure 69 Filter for paper making	103
Figure 70 Filter for paper making	104
Figure 71 air	104
Figure 72 Paper taking	105
Figure 73 Paper made from sugarcane leaves	105
Figure 74 Andrographis	107
Figure 75 Cinnamomum rubra	107
Figure 76 Mulberry	108
Figure 77 Anemone solanum	108
Figure 78 bamboo	109
Figure 79 Banyan	109
Figure 80 Pine tree	110
Figure 81 False forsythia	110
Figure 82 porphyra tenera	111

Figure 83 Saccharina japonica	111
Figure 84 Paper materials representative data histogram	116
Figure 85 Paper material knowledge level data histogram	116
Figure 86 Saccharina japonica	117
Figure 87 Saccharina japonica structure	118
Figure 88 Saccharina japonica structure	119
Figure 89 Saccharina japonica paper experiment design drawing	121
Figure 90 Saccharina japonica	121
Figure 91 Cut and splice the blades	122
Figure 92 Press	122
Figure 93 Drying process	122
Figure 94 Finished product	123
Figure 95 Saccharina japonica	123
Figure 96 Cut the blades	124
Figure 97 cleanse	124
Figure 98 Waterflood fermentation	124
Figure 99 Samples after fermentation	124
Figure 100 Prepare the birdbath and strainer	125
Figure 101 Cleaning and filtration	125
Figure 102 equalize	125
Figure 103 Let water out	125
Figure 104 Air dry	126
Figure 105 Saccharina japonica	126
Figure 106 Blade grinding	127
Figure 107 Heated stove	127
Figure 108 Heat to a boil, then reduce to a simmer	128
Figure 109 Record the cooking process	128
Figure 110 cleanse	128
Figure 111 High pressure cleaning	129

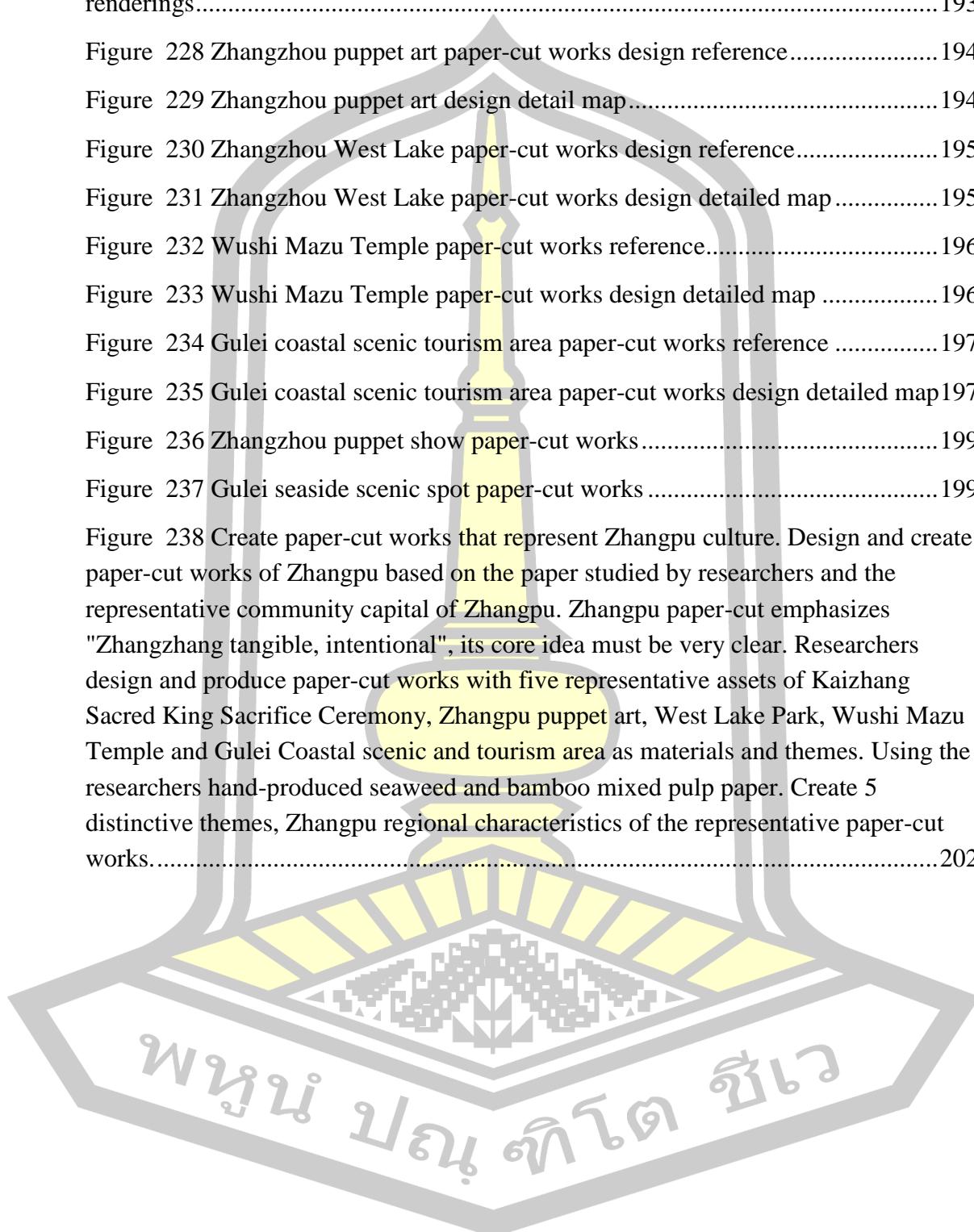
Figure 112 The mixture is crushed under high pressure.....	129
Figure 113 Pulp is made by filtering.....	129
Figure 114 P Record experimental data.....	130
Figure 115 Lost water	130
Figure 116 Air dry	130
Figure 117 Air dry 2	131
Figure 118 Finished paper	131
Figure 119 porphyra tenera.....	133
Figure 120 porphyra tenera paper experiment design.....	135
Figure 121 Chop up	136
Figure 122 Waterflood fermentation	136
Figure 123 Leaves after fermentation.....	136
Figure 124 Prepare the birdbath and strainer.....	136
Figure 125 Filtered pulp.....	137
Figure 126 The pulp is evenly coated.....	137
Figure 127 Loss of water	137
Figure 128 Loss of water	138
Figure 129 Air dry	138
Figure 130 Finished detail close-up.....	138
Figure 131 Tear to pieces.....	139
Figure 132 cleanse	139
Figure 133 Waterflood fermentation	139
Figure 134 Observe the fermentation effect	139
Figure 135 Observe the fermentation effect	140
Figure 136 Observe the fermentation effect	140
Figure 137 Clean the filter pulp	140
Figure 138 Clean the filter pulp	140
Figure 139 The pulp is evenly coated	141
Figure 140 The pulp is evenly coated	141

Figure 141 Air dry	141
Figure 142 Paper detailing	142
Figure 143 Tear a leaf	142
Figure 144 Tear a leaf	142
Figure 145 water	143
Figure 146 Bring to a boil over high heat and reduce to a simmer.....	143
Figure 147 Boiling process	143
Figure 148 Boiling process	143
Figure 149 Pour the pulp into the strainer	144
Figure 150 Pour the pulp into the strainer	144
Figure 151 Rinse the pulp with water	145
Figure 152 Water gun	145
Figure 153 The high pressure water gun impinges the pulp	145
Figure 154 The high pressure water gun impinges the pulp	146
Figure 155 The foam produced when the water gun hits the pulp.....	146
Figure 156 The foam produced when the water gun hits the pulp.....	146
Figure 157 Pulp after water gun impact.....	146
Figure 158 The mixture after the water gun hits the pulp.....	147
Figure 159 The impact of the high pressure water gun makes the pulp dissolve in water and the pulp becomes less	147
Figure 160 After repeated shocks, the pulp almost completely disappeared.....	147
Figure 161 Strain the pulp mixture	147
Figure 162 Strain the pulp mixture	148
Figure 163 Get pure pulp	148
Figure 164 Pour 500 grams of pulp into the net	148
Figure 165 Loss of water	149
Figure 166 Air dry	149
Figure 167 Paper detail	149
Figure 168 Bamboo.....	151

Figure 169 Bamboo flower	151
Figure 170 Bamboo shoot.....	152
Figure 171 Bamboo shoot.....	152
Figure 172 Bamboo.....	153
Figure 173 Mix pulp	156
Figure 174 Saccharina japonica	157
Figure 175 Chop the ingredients.....	157
Figure 176 Bring to the boil.....	158
Figure 177Record of the boiling process	158
Figure 178 Rinse	159
Figure 179 High pressure water cannon	159
Figure 180 High-pressure shredding.....	160
Figure 181 filtration	160
Figure 182 pulp	160
Figure 183 weigh	161
Figure 184 Wash and soak.....	161
Figure 185 Cooking	162
Figure 186 Changes in the material during cooking	162
Figure 187 Wash with clean water.....	163
Figure 188 High-pressure water gun cutting	163
Figure 189 Mix pulp in a ratio of 1:9.....	164
Figure 190 made into paper	164
Figure 191 Mix the pulp in a ratio of 2:8.....	164
Figure 192 Mix the pulp in a ratio of 3:7	165
Figure 193 made into paper	165
Figure 194 Mix the pulp in a ratio of 4:6.....	165
Figure 195 made into paper	165
Figure 196 Mix the pulp in a 5:5 ratio	166
Figure 197 made into paper	166

Figure 198 Mix the pulp in a ratio of 6:4	166
Figure 199 made into paper	166
Figure 201 made into paper	167
Figure 202 Mix the pulp in a ratio of 8:2	167
Figure 203 made into paper	167
Figure 204 Mix the pulp in a ratio of 9:1	167
Figure 205 Prepare the nori ingredients	168
Figure 206 Wash and soak	168
Figure 207 The process of heating and boiling seaweed varies	169
Figure 208 Wash and filter the boiled material	169
Figure 209 High-pressure water gun cutting material	170
Figure 210 Liquid that melts into chips after cutting	170
Figure 211 Filter and obtain pulp	171
Figure 212 Mix the pulp in a ratio of 1:9	171
Figure 213 made into paper	171
Figure 214 Mix the pulp in a ratio of 2:8	172
Figure 215 made into paper	172
Figure 216 made into paper	173
Figure 217 Mix the pulp at a ratio of 4:7	173
Figure 218 made into paper	173
Figure 219 Mix the pulp in a 5:5 ratio	173
Figure 220 made into paper	174
Figure 221 Chen Yuanguang sacrificial ceremony paper-cut works design sketch	186
Figure 222 Zhangzhou puppet show paper-cut works design sketch	187
Figure 223 Zhangzhou West Lake Park paper-cut design sketch	188
Figure 224 Wushi Mazu Temple paper-cut works design draft	189
Figure 225 Gulei coastal scenic tourism area paper-cut works design draft	189
Figure 226 Chen Yuanguang sacrificial ceremony paper-cut works design reference	192

Figure 227 Chen Yuanguang sacrificial ceremony paper-cut works design detailed renderings.....	193
Figure 228 Zhangzhou puppet art paper-cut works design reference.....	194
Figure 229 Zhangzhou puppet art design detail map.....	194
Figure 230 Zhangzhou West Lake paper-cut works design reference.....	195
Figure 231 Zhangzhou West Lake paper-cut works design detailed map	195
Figure 232 Wushi Mazu Temple paper-cut works reference.....	196
Figure 233 Wushi Mazu Temple paper-cut works design detailed map	196
Figure 234 Gulei coastal scenic tourism area paper-cut works reference	197
Figure 235 Gulei coastal scenic tourism area paper-cut works design detailed map	197
Figure 236 Zhangzhou puppet show paper-cut works.....	199
Figure 237 Gulei seaside scenic spot paper-cut works	199
Figure 238 Create paper-cut works that represent Zhangpu culture. Design and create paper-cut works of Zhangpu based on the paper studied by researchers and the representative community capital of Zhangpu. Zhangpu paper-cut emphasizes "Zhangzhang tangible, intentional", its core idea must be very clear. Researchers design and produce paper-cut works with five representative assets of Kaizhang Sacred King Sacrifice Ceremony, Zhangpu puppet art, West Lake Park, Wushi Mazu Temple and Gulei Coastal scenic and tourism area as materials and themes. Using the researchers hand-produced seaweed and bamboo mixed pulp paper. Create 5 distinctive themes, Zhangpu regional characteristics of the representative paper-cut works.....	202



CHAPTER I

Introduction

1.1 Background of Research

The research text of this study is paper-cut art, paper-cut, also called paper-cutting, is a kind of hollow art. As one of the oldest folk arts of the Han nationality in China, it carries rich historical culture and profound national characteristics. Visually, it gives people a sense of emptiness and artistic enjoyment. It is a folk art with scissors or carving knife as the main tool, paper as the main processing object, cutting patterns on paper, and some areas also use the way of tearing paper and ironing paper to create, and the works created are used to decorate life or cooperate with other folk activities. In China, the art of paper-cutting has a long history, its skills and styles vary with different regions and times, paper-cutting art reflects the Chinese folk life style, traditional beliefs and ethics, is an important part of Chinese culture. Paper-cutting has a broad mass base, blending in the social life of people of all ethnic groups, is an important part of various folk activities, and is also the most popular and national characteristics of the art category.

Paper-cut is an ancient folk art. Chinese folk paper-cut handicraft art has its own formation and development process. As an art form, the development of paper cutting is closely related to the invention of paper. Paper was invented in the Western Han Dynasty BC (6th century BC), before which there can be no paper-cutting art, but people use other thin materials, through the hollow carving techniques to make crafts, but as early as the emergence of paper has been very popular, such as the use of carving, engraving, picking, engraving, cutting techniques in gold foil, leather, silk, and even cut patterns on the leaves. These are of the same nature as paper-cutting, and their appearance has laid the foundation for the formation of folk paper-cutting. In 1967, Chinese archaeologists found two paper-cut pieces in the ancient tombs of the Northern Dynasty in Astana near Gaochang Site in Turpan Basin of Xinjiang Province, which are the earliest paper-cut works found in China. They used hemp paper, and they were all flower paper-cuts. The discovery of these two Tuanhua paper-cuts provides material evidence for China's long history of paper-cuts, according to the examination, these two paper-cuts have been 1500 years ago. The history of paper-cutting art, that is, paper-cutting in the true sense, should begin with the appearance of paper. Paper is one of the four great inventions of China. In the first year of Yuan Xing in the Eastern Han Dynasty and Emperor Yuan (105 AD), CAI Lun, on the basis of summarizing the experience of his predecessors in making silk fabrics, made plant fiber paper suitable for writing with bark, broken fishing nets, rags and hemp as raw materials in Luoyang, making paper a widely used writing material. The main material of paper cutting is paper, and the popularity of paper and low price have promoted the emergence and development of paper cutting. In the course of thousands of years of development, the art of paper-cutting not only concentrated the traditional concept of Han culture, but also reflected the humanistic spirit and ideological pulse of the Chinese people. As an important part of Chinese traditional culture, paper cutting art shows Chinese traditional beliefs and ethics, and becomes an important window to observe and understand the cultural inheritance of national folk customs. In 2006, the art of Chinese paper-cutting was approved by The State Council

to be included in the first batch of national intangible cultural heritage lists, a move that marked the official recognition and protection of its cultural value. In 2009, Chinese paper cutting further gained international recognition and was included in the "Representative List of the Intangible Cultural Heritage of Humanity" by UNESCO. This not only demonstrates the importance of paper-cutting in Chinese art and culture, but also emphasizes its value in global cultural heritage. With the passage of time, the art of paper cutting has not only been carried forward in China, but also gained wide recognition and appreciation around the world. Through various international exchanges and exhibitions, the art of paper cutting has become a cultural bridge connecting China and the world, and has promoted diverse cultural exchanges and mutual understanding. This achievement of paper-cutting art is not only a tribute to traditional Chinese culture, but also a contribution to the common cultural heritage of all mankind.

Paper-cutting art is popular because of the simplicity of its materials and low cost. This art form not only ADAPTS to a wide range, but also changes the pattern, the image is vivid, and can quickly produce visual effects. Paper cutting art is particularly popular in rural areas, because it is suitable for rural women to make in their leisure time, both as a practical item, but also for beautifying the living environment. In different regions of China, paper-cut art has formed its own distinctive styles and schools. Each style not only shows the regional cultural characteristics, but also reflects the local lifestyle and aesthetic habits. As an important part of Chinese traditional culture, folk paper-cut art is not only comprehensive and beautiful in expression form, but also rich in auspicious meanings. It is not only a visual art, but also deeply conveys the connotation and essence of traditional culture, such as family values, moral beliefs and national spirit. These cultural elements are preserved and inherited through the unique expression of paper-cut art, making paper-cut not only an artistic creation, but also a bridge between the past and the present, tradition and modernity. As a complete system of Chinese culture, the rich and profound cultural significance of folk paper-cut art originates from the vast geographical, historical and cultural background of China. The diversity and uniqueness of this art form are reflected in the history, culture, geographical climate, customs, aesthetic taste and national characteristics of different regions. The style of paper cutting in the Yellow River basin and northern areas of the Central Plains is simple and natural, often showing the natural landscape and daily life of the Central Plains. Paper cutting in the Northwest region shows a mysterious and rough style, often with carriages, camels, sheep and other themes. The southeast area is based on the water scenery, paper-cut style smooth dexterity, delicate and delicate, common lotus, fish, butterflies and other themes. As a representative of Fujian Province, Zhangpu paper-cut art is famous for its delicate artistic style and vivid modeling. The art of paper-cutting not only reflects the natural environment and social customs of various places, but also integrates rich traditional beliefs and folklore, making it an important window for the study of traditional Chinese culture and social changes. Through the art of paper cutting, we can observe the understanding of aesthetics, attitudes towards life, and interaction between nature and human environment in different regions. At the same time, in the continuous inheritance and innovation of paper cutting art, it also shows the vitality of Chinese folk art and the influence of the changes of The Times. The folk paper-cut in Fujian

Province is particularly prominent in the Chinese folk paper-cut art in the southeast coastal areas. In particular, the paper-cut art of Zhangpu County is famous for its delicate artistic style and vivid paper-cut shapes. Zhangpu paper-cut art not only reflects the uniqueness of local culture, but also shows the artist's deep understanding and re-creation of the beauty of nature and life. These regional characteristics not only enrich the expression of paper cutting art, but also provide a valuable perspective for the study of Chinese regional culture. Zhangpu is located in the southeast coastal area of southern Fujian, near the mountains and facing the sea, the local people take fishing and agriculture as the main production and life style. Early Zhangpu paper-cut does not exist as an independent folk art form, but is only the base of embroidery, known as "twisted flowers", in the nursery rhyme of southern Fujian, there is a song "Hinge paper": "A red paper with four folds, hinge scissors into double happiness." Hinge patterns really much, see you want to become more flower." "Reaming paper technology is really diverse, reaming red double happiness to marry the bride, reaming butterfly reaming flowers attached to the wall, I wish father mother mother long life." With the prosperity of local society and economy and the introduction of Central Plains customs such as pasting window flowers, Zhangpu paper-cut began to be widely used in folk festivals, weddings and sacrifices and other folk activities, such as the bat longevity plate for birthday celebration, and the dragon and phoenix double happiness hall for marriage. Paper cutting is used for different purposes when there are different titles, such as the paper cut pasted on the cake is called "group flower", and the paper cut set on the sacrifice is called "color clothes" when worshiping gods and ancestors. "Home ceremony with incense wine fruit is the custom, paper-cut for horse characters, etc.", the use of paper-cut can be roughly divided into: posted with, that is, directly posted on doors and Windows, walls, lights for decoration. Such as window flowers, wall flowers, ceiling flowers, lantern flowers and so on. It is used to decorate gifts, dowry, offerings, sacrifices, such as happy flowers, pig's foot flowers, fireworks, rice spoon flowers and so on. Embroidery base sample, used for clothing, shoes and hats, pillows, such as shoe flowers, pillow flowers, hat flowers and so on. For printing and dyeing, that is, as a printing plate of blue printed cloth, used for clothing, bibs, turbans and so on. Decorative painting, that is, the paper-cut mounted in the mirror frame as a decorative painting on the wall. It can be seen that Zhangpu paper-cut is widely used in festivals. Zhangpu paper-cut as the south representative of Chinese paper-cut, can be said to have a long history, hundreds of years, it is closely related to the lives of Zhangpu people.

In the review of Zhangpu folk paper-cut art, paper-cut art is mostly regarded as a manual skill of the general public and lower-class women, which is used to meet the spiritual needs of the middle and lower classes in the traditional farming society, and has not been recognized by the authorities. Due to such historical prejudice and other special reasons, paper-cut folk art has not been placed in the same position as other art forms. This has greatly restricted the development and inheritance of most folk paper-cutting arts. Among them, the biggest challenge is that the content and subject matter of paper-cutting are obsolete, and only the older generation of paper-cutting technology has superb skills, and the younger generation can not fully inherit the traditional paper-cutting technology, these problems are the challenges faced by Zhangpu paper-cutting art. Under the mode of "men cultivating and women weaving" in rural Chinese families, needlework is a compulsory course for women in their

girlhood and a common skill for housewives after marriage. Compared with the northwest, Central Plains, Southwest and other cultural circles, the form, subject matter, content and style of Zhangpu paper-cutting are closely related to the regional environment of "Southern Fujian Cultural Circle". Fujian paper-cut according to different regions, paper-cut styles are also different, Zhangpu paper-cut creation source from the local nature - mountains and sea.

After the founding of New China, Zhangpu folk paper-cut has been highly valued by the government and various departments. The cultural department of Zhangpu County has systematically explored and organized the rich folk traditional paper-cut art, and constantly improved its artistic quality, so that folk paper-cut art has entered the exhibition hall and other elegant halls from the rural areas, and has held numerous exhibitions and competitions related to paper-cut art. Promoted the development of Zhangpu paper-cutting. According to the data analysis, Zhangpu paper-cut since the Republic of China can be roughly divided into four periods, one is the early Republic of China (1912) to the mid-1950s, this period of Zhangpu paper-cut basically belongs to the continuation of the tradition. Second, from the late 1950s to the mid-1970s, the style of Zhangpu paper-cut changed from traditional (deformation) to modern (realistic). During this period, due to the attention of the government and the participation of a group of professional painting workers, Zhangpu paper-cut had a new change that was very different from the traditional techniques. Third, from the late 1970s to the late 1980s, this period is a link between the past and the future period, after more than ten years of development and change, so that Zhangpu paper-cut from the original folk activities of the auxiliary decoration to reflect the modern life of the art. Fourth, since the 1990s, it has begun to connect with the commodity economy, which is mainly characterized by the general dilution of traditional methods and the initial formation of a new style.

The selection of materials and images of paper-cut art refers to the selection of objects and matters, and Zhangpu paper-cut is the same as paper-cut in other places in China, "Zhang Zhang tangible, intentional", and the theme is distinct. To sum up, there are mainly marriage and love prayer theme, longevity theme, fortune theme, warding off evil to disaster theme, worship God and ancestors theme, teaching moral theme. Although Zhangpu paper-cut has developed in recent years, there are still some problems. The main problem is that with the acceleration of modernization and urbanization, the mode of "male ploughing and female weaving" cannot keep up with the development of The Times, and there is no succession of folk paper-cut art. Scientific and technological means replaced handicraft, commercial production replaced innovation, and intangible cultural heritage was destroyed in the name of "safeguarding intangible cultural heritage"; Folk paper-cut boutique in the drive of fame and fortune a large number of loss. In recent years, China's thousands of years of agricultural society accumulated folk paper-cut art, its disappearance, the speed of destruction is surprising and sad. Therefore, the rescue and protection of rural original ecological folk paper-cut art has become the most important responsibility of people with insight.

Facing many problems, Zhangpu paper-cut needs more people with lofty ideals to take the responsibility of inheritance and innovation. As a paper-cut art lover and a paper-cut art creator, I know I should make my contribution to the development of Zhangpu paper-cut. How to better develop Zhangpu paper cutting needs its better inheritance and innovation, on the basis of inheriting the essence of the old techniques and techniques, it also carries out new innovations and constantly ADAPTS to the development of society in order to inject more powerful life. The ecological evolution of Zhangpu paper-cutting is affected by multiple factors. First, influenced by the form of social development, from farming society to modern civilization, people's ideology, customs and habits are constantly changing, paper-cut art continues to break through the limitations of inherent forms and themes; Second, the development of science and technology and the change of production and life style have changed people's entertainment and aesthetic needs, thus producing modern paper-cut art; Third, fashion demand to promote the development of paper-cutting market, paper-cutting artists must adapt to market changes in order to survive; Fourth, the scope of application has expanded from embroidery base samples to commodity packaging, interior decoration, advertising posters, film and television animation, stamp greeting cards, etc., and the form and content are more diversified; Fifth, the modern paper industry and advanced printing technology have expanded the selection of paper-cut materials, and excellent paper makes the lines more smooth and the preservation time of paper-cut works is longer.

Art is a broad range of human activities (or their products) that involve creative imagination and are designed to express technical proficiency, beauty, emotional power, or concepts. It is a kind of human activity, a kind of human cultural identity. The research concepts I use here are community assets, innovation, cultural identity, and local wisdom. The main research concept is community assets. Zhangpu County as a community, community assets include: cultural assets, personal assets, organization/institution/unit assets, social assets, etc. The reason why Zhangpu paper-cut is called Zhangpu paper-cut must contain the unique cultural content or artistic expression of Zhangpu community in it. Zhangpu paper-cutting is inseparable from folk culture, living environment and natural conditions. Now the living environment and the pace of life have changed greatly, and the relevant processes of folk activities have been simplified, but paper cutting still cannot leave these folk activities, which is the root and soil of paper cutting. At least two conditions must be met for a skill to be classified as intangible cultural heritage: one is superficial and technical; The other is more important, is the cultural connotation behind the craft, the cultural core. The reason why Chinese paper cutting can be included in the world intangible cultural heritage list is mainly because it retains the imprint of the Chinese nation's thousands of years of farming culture. Zhangpu paper-cut represents the coastal areas, carrying the tradition of Marine culture and farming culture. Paper-cutting artists and artists have to experience and feel in folk customs. Folk paper-cut is inseparable from folk customs, although the modern living environment and pace of life have changed greatly, it is unlikely to return to the past, but artists should at least understand the root of Zhangpu paper-cut, so as to better understand and know Zhangpu paper-cut, in order to create excellent paper-cut works with Zhangpu

characteristics. This is the original driving force that drove me to Zhangpu for field investigation.

1.2 Purpose of the Research

The purpose of this study is to study the paper-cut art in Zhangpu County, Zhangzhou City, Fujian Province, China. This study has the following three important objectives.

1.2.1 Study the history, background and community capital of Zhangpu City to guide the determination of the development of paper-cutting art forms.

1.2.2 Experiment and develop paper materials from raw materials that are capital of natural resources of Zhangpu City.

1.2.3 Create paper-cut art by using cultural capital content combined with new materials obtained from experiments, leading to creative work that represents the identity of Zhangpu.

1.3 Research Questions

1.3.1 What is the geographical location and natural environment of Zhangpu County, Fujian? What kind of cultural assets, including material assets and non-material assets, have been bred in such an environment? What are the unique natural environments where crops are grown? What are the representative community assets in Zhangpu County?

1.3.2 Under the unique natural conditions of Zhangpu County, Fujian Province, what resources can be used as papermaking materials? And look for what are the differences and characteristics of their paper making? What materials can reflect Zhangpu culture? How to produce and process the material into the paper needed for paper cutting, and what is the production process?

1.3.3 How to use Zhangpu County's community assets to develop into creative products or commodities to meet modern needs? According to the content of community assets collected by research, how to create paper-cut works that represent Zhangpu culture?

1.4 Definition of Terms

1.4.1 Zhangpu paper-cut

Zhangpu paper-cut is the research text of this study, which is a traditional paper-cut art form originating from Zhangpu County, Fujian Province, China, especially referring to the paper-cut art culture and other related cultural contents in Zhangpu County, Zhangzhou City, Fujian province. Paper cutting, also known as paper carving, is a hollow art. It is one of the oldest folk arts of the Han Chinese. Visually, it gives people a sense of emptiness and artistic enjoyment. It is a folk art with scissors or carving knife as the main tool, paper as the main processing object, cutting patterns on paper, used to decorate life or cooperate with other folk activities. In China, paper cutting has a broad mass base, blending in the social life of people of all ethnic groups, is an important part of various folk activities, is the most popular and national characteristics of the art category. Zhangpu paper-cut is a sub-project of Chinese paper-cut application for World Cultural Heritage, is a representative of the southern style of Chinese paper-cut, mainly concentrated in Zhangpu County,

Zhangzhou, Fujian Province, is a national intangible cultural heritage project. It is known for its unique style and techniques, reflecting the rich culture and history of the area. Zhangpu paper-cut art is usually known for its fine cutting techniques, complex patterns and vivid forms of expression. This art form has not only been passed down for generations in the local community, but has also become an important part of Chinese folk art, reflecting the cultural characteristics of China's southeast coastal areas. Zhangpu is located in the southeast coastal area of southern Fujian, near the mountains and facing the sea, the local people take fishing and agriculture as the main production and life style. Early Zhangpu paper-cut does not exist as an independent folk art form, but is only the base of embroidery, known as "stranded flower". With the prosperity of local society and economy and the introduction of Central Plains customs such as pasting window flowers, Zhangpu paper-cut began to be widely used in folk festivals, weddings and sacrifices and other folk activities, such as the bat longevity plate for birthday celebration, and the dragon and phoenix double happiness hall for marriage. Paper cutting is used for different purposes when there are different titles, such as the paper cut pasted on the cake is called "group flower", and the paper cut set on the sacrifice is called "color clothes" when worshiping gods and ancestors. "The family ceremony with incense wine fruit has been the custom, paper-cut for horses and chariots, etc.", it can be seen that Zhangpu paper-cut is widely used in festivals. Zhangpu paper-cut as the south representative of Chinese paper-cut, can be said to have a long history, hundreds of years, it is closely related to the lives of Zhangpu people.

1.4.2 Community Capital

CommunityCapital is a concept in humanistic sociology that refers to the various resources and assets within a community that promote mutual assistance and support among community members and enhance the cohesion and sustainability of the community. The concept of community capital has been widely discussed in the field of humanities and social sciences. According to Kretzmann and McKnight (1993), community assets are seen as a variety of resources, capabilities, and strengths within a community that can be mobilized to improve community life and solve community problems. This perspective highlights a new way of looking at a community, one that focuses on the positive aspects of a community rather than just its problems and needs. To be specific, These assets include, but are not limited to, physical assets (such as schools, parks, transportation facilities), human assets (such as residents' skills and knowledge), social assets (such as community groups and networks), cultural assets (such as local traditions and cultural heritage), economic assets (such as local businesses and employment opportunities), and natural assets (such as natural environments and green Spaces) (Kretzmann&M cKnight,1993). The identification and effective use of these assets can help communities develop themselves while improving the quality of life of their residents.

The "community capital" in this study refers to the community unit in Zhangpu County, Fujian Province, including the cultural assets, personal assets, organizational assets, environmental and material assets within the community. Cultural assets include folk customs, traditional festivals, diet or work and rest rules, language and writing, religious beliefs, members' trust and dependence, and conventional values. Personal assets include an individual's skills, talents, knowledge, experience, reputation, status, wealth, and the social connections he can mobilize.

Organizational unit assets include the material, human, financial, information and influence owned by organizational units, as well as the policy assets owned by them. Environmental and physical assets include natural environments such as mountains and rivers, as well as community buildings, public spaces, infrastructure, and road transportation.

1.4.3 Innovate

In the field of humanities and social sciences, the concept of "innovation" is widely studied and has multiple meanings. According to the classic definition of Schumpeter (1934), innovation is understood as the introduction of new products, new methods, new markets, new sources of raw materials, or new forms of organization, which are the key factors driving economic development and social change. Schumpeter saw innovation as the main driver of economic development, particularly its role in the dynamics of competition and capitalism. Subsequent research has extended the concept to a wider range of areas. For example, Rogers (2003) proposed in his innovation diffusion theory that innovation is not only the novelty of technology or product, but also the social acceptance and diffusion process of these novel things. In addition, innovation is also seen as an important element in the sociocultural domain, which involves the development of new ideas, customs and practices (Rogers,2003).

"Innovation" in this study refers to the existing thinking mode to put forward ideas that are different from the conventional or ordinary people's thoughts as the guidance, using the existing knowledge and materials of Zhangpu paper cutting, in the modern environment, in line with idealized needs or to meet social needs, to improve or create new Zhangpu paper cutting things, including but not limited to various products, methods, elements, paths, environments, etc. And can achieve a certain beneficial effect of the behavior.

1.4.4 Local wisdom

The concept of "Local wisdom" is of great significance in the humanities and social sciences. According to Geertz (1983), local wisdom refers to the accumulated knowledge, skills, beliefs, and practices within a particular culture or community. This knowledge is often passed down from generation to generation and is deeply rooted in the local history, environment and social structure. Geertz emphasized that local wisdom, which reflects community members' deep understanding and adaptation to the environment in which they live, is key to understanding any culture and society. In addition, Ferguson (1994) further states that local wisdom is not just a collection of information, but a practice that is used and recreated in everyday life. Ferguson believes that this intelligence is the basis for communities to interpret and operate on their physical and social environments, and is an important resource for community innovation and problem solving.

The "local wisdom" in this study refers to the wisdom of paper cutting art in Zhangpu area of Fujian Province. It is a combination of local knowledge and tradition that is unique to a particular place in the region and has been passed down from generation to generation. In this study, mainly focused on the paper-cut color design, the wisdom of creation. It is important to express self-identity through the design and creation of paper-cut art.

1.4.5 Context of Modernity

The concept of "Context of Modernity" has been widely discussed in the social sciences and humanities. According to Giddens (1990), the context of modernity involves a series of changes and processes related to the characteristics of modern society, including industrialization, urbanization, technological innovation and globalization. In particular, Giddens emphasizes how modernity affects the daily lives of individuals, social structures, and the construction of personal identities. Similarly, Habermas (1981), in his theoretical framework, explores how modernity relates to the progress of reason, democracy, and social communication. He argues that in the context of modernity, there has been a fundamental shift in social structures and cultural patterns, especially with respect to the transmission of power, authority and knowledge.

In this study, "Context of Modernity" refers to the new social context structure in which China is connected with the global society through the modern social and economic system. The context of modernity in China appeared since the economic reform and interacted with the modernity from 1978 to the present. Modern context leads to the connection and conflict between modern culture and local wisdom. In particular, the Chinese government has a series of policies to develop the protection of non-hereditary inheritance, which is to promote local wisdom to negotiate with the outside community.

1.5 Scope of Research

1.5.1 Research scope: The research field of this study refers to that Zhangpu County is located at the southern end of the southeast coast of Fujian Province, between 24°6'-23°32' north latitude and 117°35'-117°58' east longitude. It borders Longhai District to the north, the Taiwan Strait to the east and Taiwan across the sea, Dongshan Bay to the south and Dongshan County, Yunxiao County to the southwest, and Pinghe County to the northwest. The land area is 1708 square kilometers. Zhangpu is located in the South Asia tropical, abundant sunlight, abundant rainfall, mountains and hills of 1.64 million mu, the existing cultivated land of 51,400 mu, the development of agriculture has superior conditions. After Tang Jian County, farmers opened the mountains and opened the land, and rice and fruit began to develop in Song Dynasty. In the Ming Dynasty, the land was reclaimed from the sea, advanced agricultural production techniques were promoted, water conservancy was repaired, farm tools were improved, and rice, potato, wheat, bean, peanut and fruit trees were introduced. In the Qing Dynasty, it became a famous exporting county of rice, peanuts and sugar.

Zhangpu County, the southern part of the golden triangle of southern Fujian Province, is the southern coastal county of Zhangzhou City, Fujian Province. It was established in the second year of Tang Chuigong (686), and was known as "Golden Zhangpu" after the Ming Dynasty. Zhangpu County is a thousand years old county, national culture advanced county, large population county, agricultural county, ocean county, resources county, emerging port industrial county. Taiwan Gulei Petrochemical Industry Base (100 billion industrial cluster) is an intensive place for Taiwanese investment, and has become an important part of the first coastal counties open to the outside world, modern agricultural demonstration zones and national

Cross-Straits (Fujian) agricultural cooperation experimental zones after reform and opening up.

1.5.2 Time dimension

After the founding of New China, Zhangpu folk paper-cut has been highly valued by the government and various departments. The cultural department of Zhangpu County has systematically explored and organized the rich folk traditional paper-cut art, and constantly improved its artistic quality, so that folk paper-cut art has entered the exhibition hall and other elegant halls from the rural areas, and has held numerous exhibitions and competitions related to paper-cut art. Promoted the development of Zhangpu paper-cutting. According to the data analysis, Zhangpu paper-cut since the Republic of China can be roughly divided into four periods, one is the early Republic of China (1912) to the mid-1950s, this period of Zhangpu paper-cut basically belongs to the continuation of the tradition. Second, from the late 1950s to the mid-1970s, the style of Zhangpu paper-cut changed from traditional (deformation) to modern (realistic). During this period, due to the attention of the government and the participation of a group of professional painting workers, Zhangpu paper-cut had a new change that was very different from the traditional techniques. Third, from the late 1970s to the late 1980s, this period is a link between the past and the future period, after more than ten years of development and change, so that Zhangpu paper-cut from the original folk activities of the auxiliary decoration to reflect the modern life of the art. Fourth, since the 1990s, it has begun to connect with the commodity economy, which is mainly characterized by the general dilution of traditional methods and the initial formation of a new style.

The researchers were mainly local residents, including: paper-cutting artisans in Zhangpu County, Fujian province (including old traditional artisans, young new-age paper-cutting artisans, etc.). Culture and arts related government departments in Zhangpu County, Fujian Province. Zhangpu County, Fujian Province local life of ordinary residents. Some relevant scholars who have studied paper cutting in Zhangpu, Fujian Province.

1.6 Research Methodology

This study adopts mixed research methods, including qualitative and quantitative research. Research data were collected through field work and literature research. Through the analysis of humanities and social science concepts, the research results are presented in the form of descriptive analysis and experiments. At the same time, the works are presented through the participatory creation in the participatory research method, with photos and diagrams.

1.6.1 Study populations and samples

The research topic "Paper-cut art innovation and community assets in Zhangpu, Fujian Province" includes institutional research groups. They can be divided into the following categories:

The paper cutting art artisans in Zhangpu County, Fujian province, and the inheritance of the paper cutting art in Zhangpu, Fujian, pay attention to a certain pedigree relationship, and most of the inheritants have learned from the disciples of the "Four flower mums" in Zhangpu paper cutting, the four flower mums: Chen Jin, Lin Tao, Huang Su, Chen Pao Lai, and the four people are called the four God scissors in Zhangpu. At present, most of the representative paper-cutting artists in Zhangpu County are the inheritors of the four flowers. It has certain

representativeness and is the main group of people in the study. They not only inherited the superb paper-cutting skills, but also inherited the cultural connotation behind paper-cutting.

Staff of government departments related to culture and art in Zhangpu County, Fujian Province, Zhangpu paper-cut can be recognized nationwide, and even go to the world, and the role of local government departments related to culture and art is huge. In order to excavate and protect Zhangpu paper-cutting art, local government departments have introduced a series of policies and activities. Including the creation of paper-cutting training courses, held paper-cutting art exhibitions, while many government workers are also paper-cutting enthusiasts and creators, is a very special and meaningful group.

The ordinary residents of Zhangpu County, Fujian Province refer to the native natives. Many of them have grown up watching the development of Zhangpu paper-cutting since childhood. Although most of them can't cut paper or are not engaged in paper-cutting related work, they are most familiar with the local folk customs and geographical environment. The reason why Zhangpu paper-cut is so representative is inseparable from the local cultural soil. In order to better understand Zhangpu paper-cutting, we must understand the cultural soil behind it.

Some relevant scholars who have studied paper cutting in Zhangpu, Fujian Province. Zhangpu paper-cut, as a representative branch of South China paper-cut, has been studied by many scholars before me and has also achieved certain research results. If we can understand and master their research content and results, we will be more conducive to our own research. Scholars will also take local culture as the research object to promote local culture to a higher academic level.

1.6.2 Use instrument

Mobile phones, cameras, voice recorders, laptops, computers, etc.

1.6.3 Data collection

Fieldwork and data collection

1) Interview; Formal interviews, informal interviews, focus group interviews.

2) Observe; Normal observation (or general observation), participatory observation.

Literature collection.

A tool or device used for data collection.

1) Video (cameras, recording equipment).

2) Recorded.

3) Field notebook.

1.6.4 Data analysis

Data synthesis: The researcher collects data using the conceptual framework of the research as the main tool while grouping the data into simple groups. After collecting the data, information is provided in the system according to the research objectives, and detailed information synthesis is carried out. I constantly review the data to see if each set of information is sufficient, is there any part that is not enough? This is to gather more information.

Data analysis: Researchers perform descriptive analysis of the data, with concepts in each chapter of the study. In addition, I will conduct dialogue analysis through the research of others. Whether it is the study of paper-cut art or the study of the same concept group, it is my work to study this matter.

1.7 Literature review

Through the collection and collation of relevant literature, it can be seen that the research on Zhangpu paper-cut is still very rare. There are some articles on Chinese paper-cut research, but the research projects on Zhangpu paper-cut are very few. Summarizing the current research projects on Zhangpu, the main focus is on the historical development of Zhangpu paper-cutting art and paper-cutting techniques. There is no innovative paper cutting research from the perspective of community assets. At present, the main research at home and abroad is summarized as follows:

1.7.1 Research on the art techniques of paper-cutting in Zhangpu

This is the most researched direction in many materials, mainly to record the production techniques and characteristics of Zhangpu paper-cut, and to accumulate knowledge for the inheritance and development of Zhangpu paper-cut art. The types of Zhangpu paper-cut can be divided by the representative characters and works of paper-cut. Early representatives of the older generation of Zhangpu paper-cutting artists include Chen Pao Lai, Lin Tao, Huang Su, etc. Most of their works are natural and naive, and are not limited by paper patterns. They create freely and cut whatever they want. Gao Shaoping, Zhang Zhengrong and Chen Jin are the representatives of the new generation of Zhangpu paper-cut artists. They mainly work in the form of team cooperation. Their works are large in scale, reasonable in composition, and focus on theme, artistry and integrity, with a strong sense of form and rhythm. The works of the older generation of Zhangpu paper-cutting artists are mainly based on local areas, oceans and folklore. And the new generation of Zhangpu paper-cut artists works more rich and extensive.

Huang Jian (2007) combs and interprets the shapes and patterns of the paper-cut art in southern Fujian in his study of Skillful Preparation: Research on Folk Paper-cut Art in Southern Fujian, establishing a new historical dimension for the contemporary paper-cut theory and practice in southern Fujian. Chen Yicong (2013) discussed in "Combination of Cultural Development in Zhangpu" that in order to open the market, Zhangpu integrated paper-cutting and calligraphy paintings into products and developed a series of art works with high added value and could be collected. Zhang Zhengrong (2010) elaborated the characteristics of Zhangpu folk paper-cut art, investigated the status quo of Zhangpu folk paper-cut art and its inheritance and development, and discussed ways to accelerate the inheritance and development of Zhangpu paper-cut art from the aspects of improving awareness and innovating development mechanism in Shallow Exploration of the inheritance and development of Zhangpu folk paper-cut art. Chen Dan (2013) explored the similarities and differences between Huang Su and Gao Shaoping, Zhangpu folk paper-cutting artists, in the selection of subject matter and technique innovation, and further discussed the protection and inheritance of paper-cutting art. Chen Yihong (2014), in An Analysis of the paper-cut Art of Zhangpu, discussed how to make the paper-cut art better inherit and develop from the aspects of the artistic style, development context and

innovative development path of Zhangpu folk paper-cut. LAN Dawen (2013) deeply discussed the artistic characteristics and humanistic value of Zhangpu folk paper-cut art in his book, *Cultural Interpretation of Paper-cut Art in Southern Fujian and its Protection and Inheritance*, and made an in-depth analysis of the existing research on Zhangpu paper-cut art, which not only provided theoretical and realization basis for the writing of this paper, but also contributed contemporary people's strength to its living inheritance. At the same time, it can be seen that its research perspective mostly stays in the field of folk culture, which provides the possibility for this paper to study Zhangpu folk paper-cutting from the perspective of cultural morphology.

1.7.2 Research on the inheritance of Zhangpu paper-cut art

After the founding of New China, under the attention and protection of the cultural department of the local government, Zhangpu paper-cut art has developed rapidly. Especially since the reform and opening up, the local government attaches great importance to this folk art treasure, and strives to rescue, protect, and develop, so that the ancient Zhangpu paper-cut folk art shines with brilliant brilliance. After the founding of New China, with the improvement of the people's material living standards, the spiritual and cultural life needs are increasingly enhanced, many folk customs in the countryside not only inherited down, but also given some reform and innovation content, Zhangpu paper cutting has been better inherited and developed. Of course, although this traditional folk activity needs to be inherited in the Cultural Revolution period, but in general, the impact of the time is not long, not destructive, this way of inheritance still plays an important role in the vast rural areas of Zhangpu. Family inheritance is also further carried forward due to the government's protection and promotion of folk art, and the inheritance of flavus family paper-cut art is the most typical. Under the influence of Huang Su, her sister Huang Hu, daughter Zheng Xiaorui, granddaughter Zhang Zhengrong, granddaughter Zhang Liqun, granddaughter-in-law Wang Weihong, granddaughter-in-law Dai Shuyu, great-granddaughter Yang Zhuoqing, great-grandson Huang Pubo and so on have been true, and Zhang Zhengrong, Zheng Xiaorui and Zhang Liqun and other descendants have also obtained high artistic achievements, which can be described as "better than blue". Zhangpu County government awarded the "Zhangpu County paper-cutting family" honorable title. With the goal of improving the level of paper-cut art and spreading the excellent culture of the Chinese nation, they study paper-cut art diligently. They have been invited to participate in the foreign cultural exchange delegation of the Ministry of Culture and the provincial people's Government for many times to engage in cultural and artistic exchange activities, and are well-known at home and abroad in the folk paper-cut art circle, which gives new content to the family-style inheritance of Zhangpu paper-cut art. Although the early natural inheritance of Zhangpu paper-cut art protection role, but because of the "closed" characteristics, restricted the popularization and development of Zhangpu paper-cut art. After the liberation, the local government attached great importance to the development of this folk art treasure, and adopted a new method of inheritance with remarkable effect - collective organized inheritance. As early as the 1950s during the "village night school" and "cultural literacy" activities, the Zhangpu County education and culture department has held paper-cutting training courses in old town, Chengguan and other townships, hired Chen Jin and Huang Su as teachers, and cultivated a group of paper-cutting art successors such as Chen Qiuri, Zheng Xiaorui, Gao Qiuyun, Hong Shujin. In 1956,

Mr. Huang Su, as the representative of Zhangpu folk paper-cutting artists, was recruited to Zhangpu Erlight Arts and Crafts Association at the age of 48 to engage in professional paper-cutting. Later, he was introduced to Longxi Erlight Arts Association to lead his students to create paper-cutting works for export and earn foreign exchange, becoming the first professional paper-cutting official in Fujian Province, which has brought positive influence on the inheritance and development of Zhangpu paper-cutting. In terms of organization-driven inheritance, in order to better popularize and improve, Zhangpu County Cultural Museum has also established Zhangpu Paper-cut Art Research Association, collected a number of folk paper-cut works, organized paper-cut art exhibitions, mobilized folk paper-cut artists to contribute to various newspapers and periodicals, and compiled Zhangpu paper-cut into local textbooks for kindergartens, primary schools and middle schools in Zhangpu County. This way of inheritance is an important development and change of traditional natural inheritance, which plays a pivotal role in the protection and development of Zhangpu paper-cut art.

1.8 Concept, Theory and Conceptual framework

Local wisdom and local knowledge

Local wisdom is one of the main concepts used by researchers in the study of paper cutting art in Zhangpu, China. I had with Clifford, who (CliffordGeertz) of the local knowledge: further proceedings of explanation anthropology (1 LocalKnowledge: Further Essays in Interpretive anthropology) as a concept to explain and local knowledge related to local wisdom.

CliffordGeertz (1983) proposes that local wisdom is the combination of knowledge and tradition specific to a place, which is passed down from generation to generation. Local knowledge is directly related to local knowledge. Both are the knowledge that the people of a community have developed through the experience, trial and error of local residents. Until it becomes knowledge that is used in the life of that society, until it becomes a culture that is relevant to the local environment. Some social scientists conceptualize knowledge within the framework of naturalism and emphasize the progression between recent knowledge and knowledge acquired over many generations. These descriptions use terms such as adaptively acquired knowledge, socially constructed knowledge, and other terms that emphasize the social aspects of knowledge. Local knowledge and traditional knowledge can be distinguished according to the length of time they have existed.

Local wisdom has been passed on to each other until it becomes the traditional knowledge of each society. It is seen as a body of knowledge that is embedded in the cultural traditions of communities at the ethnic and regional levels. Traditional forms of knowledge include the types of knowledge of traditional survival techniques, such as hunting tools and techniques, agriculture, and handicraft skills. Including Chinese Zhangpu paper-cut art knowledge.

Therefore, local wisdom is a kind of knowledge that is essential for the life and survival of the region. It is generally based on the accumulation of empirical observations and interactions with the environment. In this context, local wisdom refers to the fact that the knowledge or technology of a minority is a treasure trove of ancient wisdom, developed through trial and error, experience gained over centuries,

time-tested, but usually unsubstantiated by any scientific evidence. However, most indigenous knowledge or technology is considered scientifically valid and valid.

The Art in Local Wisdom, Local Knowledge and Traditional Knowledge describes traditional knowledge as "a cumulative body of knowledge, know-how, practices and representations maintained and developed by people with a long history of interacting with the natural environment". These complex understandings, interpretations, and meanings are essential components of a cultural complex that includes language, naming and classification systems, resource use practices, rituals, spirituality, and worldviews."

In many cases, local wisdom in traditional knowledge has been passed down from person to person as an oral tradition. Some forms of traditional knowledge are expressed in culture, stories, legends, folklore, rituals, songs and laws. Other forms of traditional knowledge are expressed in other ways. Art is in the dimension of local wisdom and knowledge, and is therefore placed in the social chain. From being produced, to being used, to appreciating the values, beliefs and symbols of beauty that contain art, to the transmission of art from generation to generation. From the above, art really became the center of the cultural system associated with it.

Traditional knowledge often separates one community from another. In some communities, traditional knowledge has personal and spiritual significance. Traditional knowledge can also reflect the interests of a community. Some communities rely on their traditional knowledge to survive. Traditional knowledge about the environment, such as taboos, proverbs and cosmological knowledge systems, may provide a climate of conservation for biodiversity conservation. This is particularly true of traditional environmental knowledge, which refers to "specific forms of site-based knowledge about the diversity and interactions between plant and animal species, landforms, waterways, and other qualities of the biophysical environment in a given location".

For Zhangpu paper-cut art, this is an art that was born, accumulated and passed down from generation to generation in Zhangpu County. Therefore, "Zhangpu paper-cut art" indeed belongs to the category of "local wisdom" and "local knowledge".

Concepts and conceptual frameworks

There are many concepts in this study. There is a certain relationship between the texts of "Zhangpu Paper-cut in Zhangzhou City, Fujian Province". The main research concept is community assets, and the concepts of local wisdom, cultural identity, innovation and semiotics are combined to support it. In this study, "community assets" refers to the community unit in Zhangpu County, Fujian Province, including cultural assets, personal assets, organizational assets, environmental and material assets. Cultural assets include folk customs, traditional festivals, diet or work and rest rules, language and writing, religious beliefs, members' trust and dependence, and conventional values. Personal assets include an individual's skills, talents, knowledge, experience, reputation, status, wealth, and the social connections he can mobilize. Organizational unit assets include the material, human, financial, information and influence owned by organizational units, as well as the policy assets owned by them. Environmental and physical assets include natural environments such as mountains and rivers, as well as community buildings, public spaces, infrastructure, and road transportation. Cultural identity is a sense of group

cultural identity, a sense that an individual is influenced by the group's culture. Although there are similarities with political identification, they are not synonymous. Cultural identity, especially recognition of foreign cultural values, is enough to disintegrate a country's political system; On the contrary, the strong identity of its people with its own culture is the great spiritual strength of the country's self-reliance in the world. Culture is closely related to people's particular way of life. It is impossible for contemporary people to live in the ancient way of life. There is no realistic basis for reviving traditional culture, let alone rebuilding cultural identity. Rationally weighing the history and reality, only based on the new cultural tradition, can create a new culture with both national "self-nature" and human "commonness", in order to build a real cultural identity; In the process of rebuilding cultural identity, we should treat modernity and globalization rationally and critically

Based on the above correlation structure, I designed a research conceptual framework as a thinking tool in research work, as shown in the figure below:

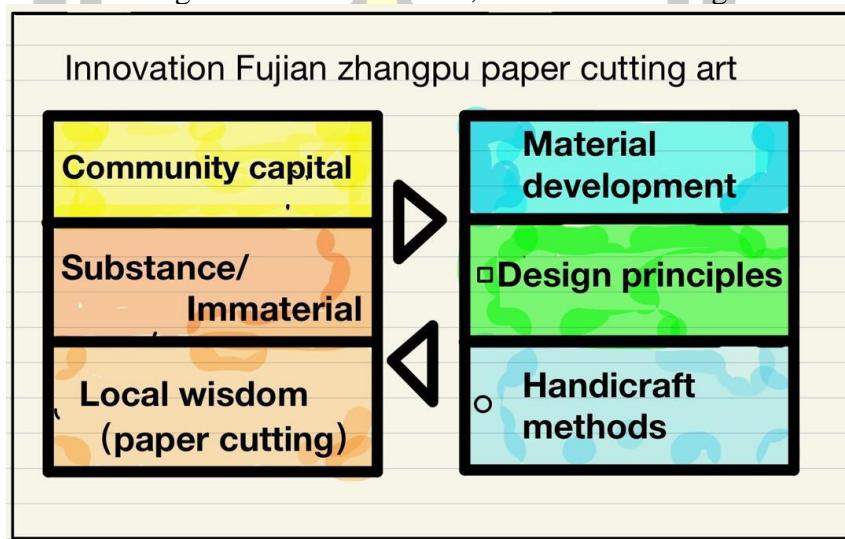


Figure 1 Conceptual framework

1.9 Research structure and Benefit of Research

1.9.1 Research structure

Chapter 1: Introduction

Chapter 2: The historical development of Zhangpu paper-cutting and The local wisdom of Zhangpu paper-cut creation

Chapter 3: the summary of community assets in Zhangpu County, Fujian Province

Chapter 4: Research on the materials and techniques of paper making in Zhangpu County

Chapter 5: The innovative production of the representative paper-cut works of Zhangpu community assets

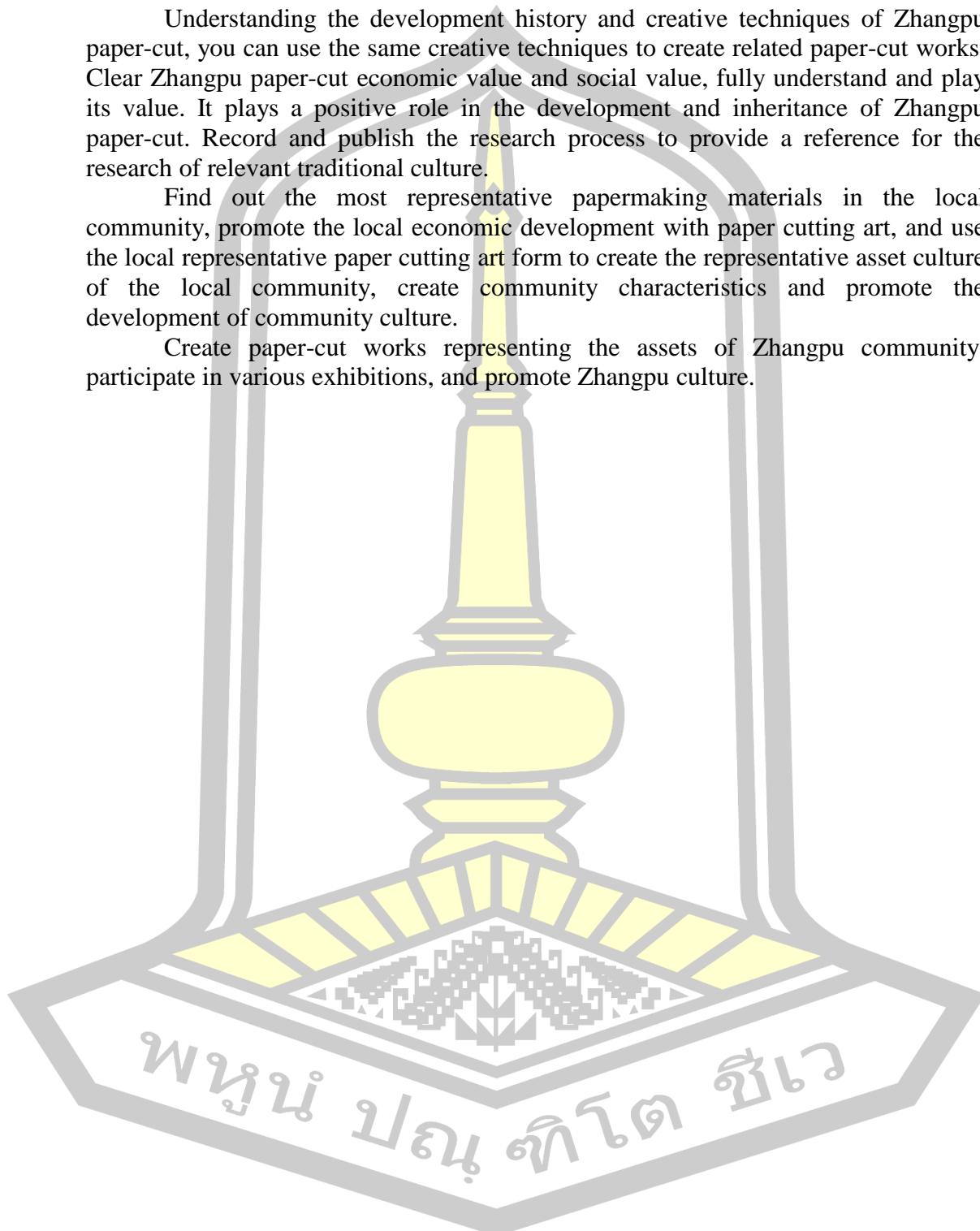
Chapter 6: Concluding remarks

1.9.2 Benefit of Research

Understanding the development history and creative techniques of Zhangpu paper-cut, you can use the same creative techniques to create related paper-cut works. Clear Zhangpu paper-cut economic value and social value, fully understand and play its value. It plays a positive role in the development and inheritance of Zhangpu paper-cut. Record and publish the research process to provide a reference for the research of relevant traditional culture.

Find out the most representative papermaking materials in the local community, promote the local economic development with paper cutting art, and use the local representative paper cutting art form to create the representative asset culture of the local community, create community characteristics and promote the development of community culture.

Create paper-cut works representing the assets of Zhangpu community, participate in various exhibitions, and promote Zhangpu culture.



CHAPTER II

Local wisdom in the art of Zhangpu paper-cutting

Local wisdom is the knowledge acquired by a group of people in a particular area or place through a series of activities and then passed down orally from generation to generation. Local wisdom itself includes not only knowledge, but also life values. The term "local wisdom" is also known as "indigenous knowledge" or "traditional knowledge". When it comes to local wisdom or local knowledge, Ahlee et al. (2014) point out that local wisdom is a body of knowledge acquired through a series of activities such as observation, analysis, interpretation, and drawing conclusions. Furthermore, this definition relates to local (region, place/locality), then local wisdom is nothing more than a collection of knowledge of the thoughts and actions of people in a place (region) or location. Ahleeet.al's (2014) definition of local wisdom suggests that local wisdom corresponds to the status of popular knowledge (modern knowledge), i.e. knowledge acquired through scientific processes (scientific), or more commonly, knowledge acquired through inquiry methods. However, Tinnaluck(2004) points out that there are some differences between local wisdom and popular knowledge, that is, in terms of transmission, local wisdom is transmitted orally without formal institutions, while popular knowledge is empirical and requires formal institutions. As Keraf(2002) points out in Muslims (2014), local wisdom includes all forms of knowledge, belief, understanding or insight and customs that guide human behavior in life. Although institutionally, local wisdom differs from popular knowledge, in general, local wisdom has similarities in access, that is, the use of scientific rules so that local wisdom focuses not only on acquiring knowledge, but also on building social relationships. The logical consequence of this situation is the need to integrate local wisdom itself as a collection of learned knowledge. The process of incorporating local wisdom into learning is open, in the sense that local wisdom, as a collection of knowledge including rules of life and values, can be incorporated into any curriculum, but in this case, local wisdom is integrated into the ecology discipline. This is based on the proximity between ecology and local wisdom, both in terms of knowledge acquisition processes using scientific rules (rules of inquiry) and in collaborative work processes. Today, as one of the steps to filter

global wisdom, the role of local wisdom becomes an issue. Culture is part of the local wisdom. Local wisdom is how the local community views life, science, customs and traditions. Local wisdom is that local ideas are wise, full of wisdom, good value, embedded and followed by community members (Sartini,2006). Because local wisdom also refers to the mere aggregation of thoughts and actions of people in a particular region or place. Before exploring the local wisdom in Zhangpu paper-cut art, let us first understand the natural conditions and living environment of Zhangpu area.

2.1 History and geographical location of Zhangpu

Tang Chugong two years (686) set up Zhangzhou, and set up Zhangpu, Huaien two counties; In the fourth year of Kaiyuan (716), the state administration moved from the southern foot of Pantuo Ling to Li Aochuan (Sui'an Town, Zhangpu County). Twenty-nine years after Kaiyuan, Longxi County and Longyan County came under its control, and Huaien County was incorporated into Zhangpu County. In 786 (Zhenyuan two years), the state resettled Longxi County Guilin Village (today's Zhangzhou city). From the first year of Tianbao (742) to the second year of Qianyuan (759), Zhangzhou was changed to Zhangpu County. In 886 (the second year of Tang Guangqi), the three brothers of Wang Chao entered Fujian with the peasant army of Wang Xu, captured Quanzhou, and the Fujian observer made Chen Yan appoint Wang Chao as governor of Quanzhou. To 947, the Southern Tang annexed the State of Fujian, and the land of Zhangzhou was the territory of Wang Chao and the State of Fujian. In 963, the Qingyuan Army (under the jurisdiction of Quanzhou, Putian, Zhangzhou) changed its name to the Ping Navy, with Chen Hongjin as the dispatcher, and Zhangzhou belonged to the Ping Navy. In 978 (the third year of Taiping and Xingguo in the Northern Song Dynasty), Chen Hongjin was incorporated into the Song Dynasty, and Zhangzhou was incorporated into the Song Dynasty with the Ping Navy. It belongs to Fujian Road in Song Dynasty. The Yuan Dynasty belongs to Zhangzhou Road. Ming belongs to Fujian Zhangzhou prefecture. Qing Dynasty set Ding Zhangzhou dragon Road Zhangzhou house. In the early period of the Republic of China, it belonged to the West Road (Tingzhang Road). Liberated on September 25, 1949, it belongs to Longxi Special District (region) and Zhangzhou City. On March 6, 2019, the Propaganda Department of the CPC Central Committee, the Ministry of Finance, the Ministry of Culture and Tourism, and the State Administration of Cultural Heritage announced the list of Counties for the Protection and Utilization of Revolutionary Cultural Relics (the first batch), and Zhangpu County was included in the list (Zhangpu County - sogou.com). This is the history of Zhangpu County, through the context of historical development analysis, Zhangpu County has a long history, limited historical records, has more than 1300 years of development history. The profound historical development will surely accumulate rich local wisdom.

Zhangpu County, located in the southeast coast of Fujian Province, China, is a county in the south of Zhangzhou City. Zhangpu County was founded in 686 AD of the Tang Dynasty, with a history of more than 1,300 years (Lin Shuyu, 2016). Zhangpu County is a county with the longest coastline in Zhangzhou City. There are three famous peninsulas along the coast of Zhangpu, namely Qianting Peninsula, Liuao Peninsula and Gulei Peninsula. The Liuao Peninsula is close to the Gulei Peninsula, and the two peninsulas form a huge bay into which the Deer Creek flows. Due to the intersection of salty and fresh water, the waters are rich in nutrition, Liuao laver and oyster in Xiamei Bay are very famous, and Gulei's abalone and prawns are also excellent brands. Due to the influence of subtropical high pressure in summer, the coastal area of Zhangpu has less rain, large wind and sand, and more salt and alkali, making it difficult for agriculture to develop. The people here have lived on the sea for generations, usually the men go to sea to earn a living, the women take care of the family, repair fishing nets and so on. (Duan Lingping, 2005) The unique geographical environment and lifestyle gave birth to rich Marine culture. The rugged terrain of Fujian has rarely been affected by the wars of the Central Plains in its history. The land of Zhangpu County is run by six rivers, which have formed numerous small plains, providing excellent conditions for farming. In southern Fujian, from coastal areas to mountainous areas, rainfall shows a gradual increasing trend. Due to the characteristics of the terrain, there is often a lot of topographic rain in the mountain area. The junction between Zhangpu and Yunxiao is the most abundant place in Zhangzhou, with annual rainfall of more than millimeters, which also makes this mountain vegetation the most luxuriant area in the country. The mountainous terrain is not afraid of floods and can guarantee harvests in both dry and flood seasons. This is also one of the reasons why Zhangpu is known as "Golden Zhangpu". Therefore, the agricultural activities in the mountains and plains of the hinterland of Zhangpu are very busy. The family members of farmers, both men and women, young and old, are busy working all year round, so the residents of the hinterland rarely have time to do other trivial things. Therefore, paper cutting in Zhangpu is more common in the coastal fishing villages between Qianting, Liuao and Gulei Peninsula. (Duan Lingping, 2005).

Zhangpu is close to the South China Sea, and there are more natural disasters in these fishing villages, because they have long been based on fishing and farming, in order to pray for good weather, good harvests, and safe sea, "There are no three points of life when sailing. In ancient times, Baisha women often had to face the reality of suffering life, in the lonely needlework, paper cutting is a good means of spiritual resolution, while away the time in the monotonous and complex slow action, and harvest the comfort of the soul. As a result, paper cutting gradually separated from embroidery and became an independent artistic language. In this sense, flower's embroidery foundation is one of the sources of the formation of Zhangpu paper-cut art. In this way, the art of paper-cutting is passed from generation to generation through the form of "sitting flower". Along with the inheritance of paper-cutting art, traditional folk concepts are also passed on from generation to generation. (Chen Jianxin, Lin Tao Paper-cut Collection, 2013). The way of "sitting flower" is in line with the traditional way of passing on local wisdom. Based on such living environment and conditions, Zhangpu County has gradually formed the local wisdom,

Zhangpu paper-cut art. As The Times progress and develop, local wisdom will evolve with them.

2.2 The development of Zhangpu paper-cutting and the development of local wisdom

Paper-cutting is a kind of hollow art. It is one of the oldest folk arts of the Han Chinese. Visually, it gives people a sense of emptiness and artistic enjoyment. It is a folk art with scissors or carving knife as the main tool, paper as the main processing object, cutting patterns on paper, and some areas also use the way of tearing paper and ironing paper to create, and the works created are used to decorate life or cooperate with other folk activities. In China, paper cutting has a broad mass base, blending in the social life of people of all ethnic groups, is an important part of various folk activities, is the most popular and national characteristics of the art category. Paper-cut because of the production of simple materials, low cost, immediate effect, a wide range of adaptation, a variety of patterns, vivid image and popular; More because paper cutting is most suitable for rural women leisure production, can be used as practical things, but also beautify life, all over the country can see paper cutting, and even formed a different local style schools. Folk paper-cut, as the embodiment of Chinese original philosophy, has comprehensive, beautifying and auspicious features in its form of expression, while folk paper-cut conveys the connotation and essence of traditional culture with its own specific way of expression. Folk paper-cut is a complete cultural system, which has profound and profound cultural significance. Due to the different history and culture, geographical climate, customs and habits, aesthetic taste, as well as different nations, different cultural environment, the formation of different artistic characteristics. The style of the Yellow River basin in the Central Plains and the northern region is simple and natural, and the content of the works is all about the scenery of the Central Plains. The northwest region is located in the plateau, and the style is mysterious and strange, rough and powerful, and the content is mostly horse-drawn carriages, camels, sheep and so on. In the southeast, there are many water towns, the style is smooth and dexterous, delicate and delicate, and the content is lotus, fish, butterflies, boats and opera figures. Various paper-cut styles coincide with the cultural characteristics of each region, reflecting the influence of cultural traditions and regional customs on plastic arts. Fujian folk paper-cut is a pearl of Chinese folk paper-cut art in the southeast coastal area. Among them, Zhangpu folk paper-cut is outstanding in Fujian folk paper-cut with its meticulous artistic style, vivid paper-cut shape and naive aesthetic feeling.

"Zhangpu County Annals" records "Yuan Xi from the 10th to the 16th night is already, God Ci home temple, or with the Aoshan puppet, lantern candles, ribbon cutting paper for flowers. Good preparation." (Collection and Research Committee of Cultural and Historical Data of the CPPCC Zhangpu County, Fujian Province, 2004) This is the only written record in ancient times. It was recorded in the Song Dynasty. It shows that the history of Zhangpu paper-cut has been early. In the early Zhangpu paper-cut does not exist as an independent folk art form, but is only the base of embroidery, which is called "stranded flower". (Ma Qianli, 2017) There is a song of "Hinge paper" in the nursery rhyme of southern Fujian: "A piece of red paper is folded four times, and hinge scissors becomes double happiness." Hinge patterns really much, see you want to become more flower." "Reaming paper technology is

really diverse, reaming red double happiness to marry the bride, reaming butterfly reaming flowers attached to the wall, I wish father mother mother long life." (Zhou Changji, 2017) With the prosperity of local society and economy and the introduction of Central Plain customs such as window decoration, Zhangpu paper-cut began to be widely used in folk festivals, weddings, sacrifices and other folk activities, such as bat longevity for birthday celebration and dragon and phoenix double happiness for marriage. Paper cutting is used for different purposes when there are different titles, such as the paper cut pasted on the cake is called "group flower", and the paper cut set on the sacrifice is called "color clothes" when worshiping gods and ancestors. (Ma Qianli, 2017) The use of paper cutting can be roughly divided into: Posting, that is, directly posted on doors and Windows, walls, lights for decoration. Such as window flowers, wall flowers, ceiling flowers, lantern flowers and so on. It is used to decorate gifts, dowry, offerings, sacrifices, such as happy flowers, pig's foot flowers, fireworks, rice spoon flowers and so on. Embroidery base sample, used for clothing, shoes and hats, pillows, such as shoe flowers, pillow flowers, hat flowers and so on. For printing and dyeing, that is, as a printing plate of blue printed cloth, used for clothing, bibs, turbans and so on. Decorative painting, that is, the paper-cut mounted in the mirror frame as a decorative painting on the wall. It can be seen that Zhangpu paper-cut is widely used in festivals. Zhangpu paper-cut as the south representative of Chinese paper-cut, can be said to have a long history, hundreds of years, it is closely related to the lives of Zhangpu people.

Although Zhangpu paper-cut is the representative of south China paper-cut, but its attention began in the 1950s. In 1952, Chen Jin and Huang Su were invited by the cultural department of Zhangpu County to participate in the paper cutting art training class. Chen Jin, together with folk painters and professional painters, created realistic works such as Dragon Boat Race, Love Labor since Childhood, Harvest in the Future, Trekking Car, Another bumper Harvest Year, and Abundant cattle and grain. Huang Su's works were selected to be exhibited in counties, regions and provinces. In 1954, Huang Su was recruited to the Zhangpu County Handicraft Working Society, paper-cutting, embroidery, sewing as a career. In April 1955, Fujian Province held a provincial folk paper-cutting exhibition, displaying nearly 600 works, most of the authors are women in rural areas and towns, and some are folk artists and art workers. Although the countryside did not set up a paper cutting factory, research society, but the life is stable, embroidery national clothing and daily necessities more up, in addition to self-cutting, paper-cut patterns can be seen everywhere in the polder and market, individual artists swimming sales are also very prosperous. Under the guidance of the "a hundred flowers bloom, bring forth the new" policy, artists have inherited and developed the art form of paper-cut, creating paper-cut works that express new socialist people and new things, and have expanded in subject matter and form. At the same time, cultural departments at all levels are working hard to revitalize the handicraft industry, and Fujian Province held a folk art and crafts exhibition, showing the works of old paper-cutting artists such as Chen Jin and Huang Su. In 1959, Zhangpu cultural Department held a paper cutting training class, Chen Jin and Huang Su served as the guidance teachers of the paper cutting training class, training Gao Qiuyun, Wu Bina, Zheng Xiaorui, Hong Shujin, Chen Qiuri and others, Zhangpu gradually set off a boom in paper cutting, "four flower" works, Commonly seen in People's Daily, Chinese Paper-cut Newspaper, Chinese Women, Fujian Daily,

Straits Evening News and other newspapers and magazines. In June 1962, Fujian Fine Arts Association and Fujian Provincial Hand Management Bureau held the "Fujian Folk paper-cut Art Exhibition" in Fuzhou West Lake, Zhangpu paper-cut participated in the exhibition, and selected some excellent works to compile and publish Fujian Paper-cut in 1965. From the 1950s to the 1970s, scenes reflecting the work and life of workers, agriculture, soldiers, schools and businesses, as well as opera figures, were incorporated into the theme of paper-cut creation, reflecting the social life of the new era and showing the spiritual outlook of modern people, but also affected by various political movements, the subject matter content to cooperate with the political movement, the wedding house should also be affixed with the leader's head and double happiness combination paper-cut, Reflects the truth of an era. Zhangpu County Cultural Center to set up paper-cutting training class as a sign, from its creative ideas, forms, Zhangpu paper-cutting divided into two types, one is the old artists represented by Lin Tao, focusing on the performance of folk paper-cutting, the other is Chen Qiuri and other young and middle-aged artists, focusing on the performance of politics, current affairs. These works are related to the policies at that time, "An important reason for the creation of this camp is the participation of a group of professional artists, such as Wu Changhe, Gao Qianhou, Ke Shuiren, etc., which has caused a new crisis of contemporary paper cutting in Zhangpu, that is, while expressing the success of real life works, the most essential folk elements of paper cutting itself have been significantly weakened." The first camp of Lintao is not a simple return to the traditional theme, but with a rational and speculative point of view at the same time to express the edge of the modern theme is directed to labor production, so, although the ideological content is not broad, but the issue of inheritance and innovation has been organically dealt with, so that contemporary Zhangpu folk paper-cut has been substantive development, which is the unique place of Lintao paper-cut "rural flavor". It is also her unique contribution to the development of Zhangpu paper cutting." (Ke Yunhan, 2003).

After the end of the "Cultural Revolution", folk paper-cut rose again, "in the late 1970s, in some national art exhibitions began to appear paper-cut works, and then the cultural department held paper-cut art exhibitions in some areas where paper-cut activities were better, or held several regional paper-cut art exhibitions, and toured exhibitions in many places." Making paper-cutting art activities once again set off a climax. A large number of paper-cut collectors came into being, although their purposes are different, some are for learning, some are for research, some are for interests, but objectively, their collection makes a large number of precious paper-cut art materials to be preserved." [3] Zhangpu paper-cut has ushered in spring again. In October 1979, "Zhangpu Paper-cut Anthology" was compiled and published; In 1982, Zhangpu paper-cut officially went abroad to participate in the international folk art exhibition in Fiji. In 1987, Zhangpu Paper-cutting Association was established as a professional institution for paper-cutting artists in Fujian province. In 1989, Zhangpu County established the Folk Art Research Association, which was listed as one of the 100 demonstration sites of Fujian Province Fangcao Plan. The Culture and Sports Bureau and Cultural Center were responsible for the management of the research association, and supported the transmission, help and lead of the four paper-cut echelons of the old, middle, young and young. In 1993, Zhangpu County successfully declared "the Hometown of Chinese Folk Art (paper cutting)". Zhangpu grassroots

cultural workers not only actively rescue, collect and organize folk paper-cut works, but also hold folk paper-cut classes in the cultural hall, hold folk paper-cut exhibitions, mobilize the enthusiasm of creators and disseminators, and push Zhangpu paper-cut to the whole country. In September 1995, Shanghai osmanthus Festival held "Zhangpu folk paper-cut Art Exhibition", Zhang Zhengrong and others brought their works to the exhibition; In 1997, Zhangpu County paper-cut Art Center was established, and Chen Qiuri, Zhang Zhengrong, Gao Shaoping, Ouyang Yanjun, You Jinmei, Li Xiaoyan, Lu Shurong and other paper-cut art galleries or studios were established successively. In September 1999, Ouyang Yanjun founded the first studio in Zhangpu County specializing in the production and sale of paper-cut, becoming the second Zhangpu paper-cut professional artist after Huang Su. In September 2003, Zhangpu County Party Committee and county government held the event of "Celebrating Lin Tao's 100th birthday and promoting Zhangpu paper-cut Art", Lin Tao was awarded the honorary titles of "Chinese folk Picasso", "Scistan peak", "Reputation of Manchu" and "Centenarians Flower", and Huang Su was awarded the title of "Longevity Flower" by Zhangpu County government. In 2009, Zhangpu Paper-cut was included in the UNESCO intangible Cultural Heritage as the sub-project of "Chinese Paper-cut". Zhangpu paper-cut art has developed step by step from a local wisdom to a national intangible heritage project, which proves its unique artistic charm, has its own unique artistic charm and local wisdom, and this kind of local wisdom is a collection of local excellent wisdom, scientific and contemporary, and is valued and protected by the state.

In coastal areas such as Zhangpu, the local wisdom folk paper-cut art is widely used in folk activities, and Zhangpu paper-cut has always played an important role in local folk culture. The formation of local wisdom Zhangpu folk paper-cut art tradition is related to the strong maritime folk culture background and local cultural characteristics. The formation of the expression style of folk art can not be separated from the soil of folk custom. Folk activities are the embodiment of people's love for life and love for beauty. The style characteristics of folk art are often the reflection of local folk aesthetic trend. The inheritance of local wisdom paper-cutting, in line with the inheritance of local wisdom, mainly relies on folk oral teaching, is an art form with original ecological cultural characteristics. In the relatively closed farming culture era, the spread of folk culture is relatively slow. The inheritance of Zhangpu folk paper-cut patterns is basically the same. The initial learning stage of paper cutting is generally in the form of "sitting flower M", learning the craft with the old flower M, according to a certain copy of the cut, passed down from generation to generation in the neighborhood and family. Every pattern in the circulation, from A to B, from the mother's family to the husband's family, some traditional themes of patterns, through different people's thinking, conception, in the form of "outrageous" or "off spectrum", create a new pattern. These highly skilled artists can cut new patterns without using samples. After several generations of evolution and improvement, each work becomes better and better. And these new patterns, like fragrant flowers and butterflies, attract and influence people in the surrounding area to learn, which is the production of local wisdom, often represented by the works created by these people. The authors of these works of art, most of whom are illiterate women, are really the crystallization of the wisdom of working women. Zhangpu paper-cut, regardless of its aesthetic characteristics and production methods, has a pure folk nature. First, the authors of the

early Zhangpu paper-cut were mainly rural women, and their creations only belonged to the category of needlework. In the creative group of paper cutting art, the main group is the vast number of rural working women, when they are five or six years old girls, have seen or follow the flower to learn paper cutting. Some women will treasure their own paper-cut patterns, as a family heirloom passed on to their daughters and daughters-in-law, the meaning of those paper-cut patterns of prosperity, peace and luck, happiness and prosperity, health and longevity, passed down from generation to generation, enduring. In the era of male cultivation and female weaving, the strict fitters of the patriarchal system made rural women's social status low and their love of beauty difficult to express, which could only be realized by virtue of feminine red. Paper-cutting activities were quite popular in Zhangpu folk, and the wisdom of countless women could be fully displayed through scissors and paper, which also made the paper-cutting art in Zhangpu folk present a brilliant scene. The second is the coexistence of folk art and folk life, Zhangpu paper-cut is closely related to the unique local custom life. In the old time, worship ancestors, reward God, worship Buddha and other sacrificial ritual activities prevail, display five sacrifices and a variety of color of the cake fruit, in each sacrifice, superimposed a well-cut, colorful paper-cut, to beautify and decorate gifts. Paper-cutting activities are also active in weddings, funerals and festival celebrations throughout the year. In the countryside of Zhangpu, every Mid-Autumn Festival, Spring Festival, etc., in the courtyard patio furnishings, offerings covered with paper-cut, each family is richer than the offerings, but also more exquisite than paper-cut. The pious attitude of worshiping the gods has been transformed into a high enthusiasm for paper cutting, and the diversity of offerings has led to the richness of paper cutting themes. Third, facing the sea, Zhangpu is rich in products, hard-working, simple and fine in character. The character of the sea is fully reflected in their paper-cut art, which is mostly related to the sea, and thus forms a unique style of local wisdom, which is unique in the Chinese folk paper-cut art. These reasons may be the important reasons for Zhangpu folk local wisdom paper-cut art as a model of Chinese folk paper-cut in the southeast coastal area. It is also an excellent case of local wisdom protection, inheritance and development.

2.3 The creative process and techniques of Zhangpu paper-cutting

2.3.1 Tools and materials

Tools: scissors, carving knife

Local wisdom is how the local community views life, science, customs and traditions. Local wisdom is that local ideas are wise, full of wisdom, good value, embedded and followed by community members (Sartini,2006). Zhangpu paper-cut art is a representative form of local wisdom in Zhangpu area. From the selection of tools, the design of themes, the application of techniques to the final works, every link contains the application of local wisdom. All these are based on Zhangpu's geographical environment, folk customs, living habits and other local factors. First of all, in the choice of tools, scissors is the first choice of Zhangpu paper-cutting tools, Fujian Zhangpu paper-cutting scissors are different from the northern scissors, but the scissors are short, sharp, slender knife edge. Such scissors can be more convenient to cut fine parts, more convenient to create delicate works. Static and delicate is the style characteristic of Zhangpu paper-cutting, which is closely connected with the living habits of local people. In addition, there are carving knives to assist scissors. Fujian

Zhangpu paper-cutting artists are used to using utility knives to assist cutting large pictures or fine parts. When the carving knife is used, it should be matched with the backing plate, so that you do not have to worry about damaging the carving knife or the desktop, and you can boldly create. Figure 1 shows the tools commonly used in paper cutting, including: scissors, carving knife, utility knife, cushion plate.



Figure 2 Paper cutting tools commonly used, including: scissors, carving knife, utility knife, cushion plate

source: Cui BaoLi 2023

Material: paper

Paper-cut art originated from folk, due to the limitations of conditions, paper-cut artists in the creation of paper-cut works of paper requirements are not high, so suitable for paper-cut paper is very much. Such as: monochrome paper, color paper, bamboo pulp paper, rice paper and so on. In Zhangpu, Fujian Province, most paper-cutting enthusiasts use rice paper for cutting. Zhangpu, Fujian Province, is a coastal area with the longest coastline of Fujian Province. The air humidity is high, and ordinary paper is easy to be spoiled by moisture, while rice paper is easy to fold and cut, uniform in color, not easy to be affected by moisture and easy to preserve. Fujian Zhangpu paper-cut is mainly red, representing happiness and faith. With the progress of conditions and aesthetic changes, there are now many artists using colored paper to create, or to create color, to create colorful works.



Figure 3 Paper

source: Cui BaoLi 2023

2.3.2 The creative process of paper cutting

Make a draft

The first is to conceive the work, draft the layout, describe the picture concretely, and draw the black and white effect.

Cut

If you use a carving knife, in order to ensure the accuracy of the image and paper, you need to use a stapler to accurately staple the book and firmly fix it around the backing plate. The carving of the figure should first focus on the five facial areas, while the flowers and birds should be finely carved first, and then start from the center and gradually depict in all directions. The order of the knives is like writing, from top to bottom, from left to right, from small to large, from fine to coarse, from part to whole. As far as possible, do not use duplicate knives, those unnecessary parts must be cut off, avoid tearing with your hands, because doing so may cause the paper cut to have rough edges, thus affecting its appearance. Local paper-cutting artists in Zhangpu have accumulated many years of creative experience and local aesthetic habits to create a representative "line-cutting" technique. The application of the line-cutting technique fully reflects the slim and delicate characteristics of Zhangpu paper-cutting. The thin and thin, group and row, repeated lines are very suitable for the expression of feathers, petals and other objects, with vivid images. (Scout, 2019)

edit

In the process of cutting, it is easy to have some mistakes or imperfections, so it needs to be revised. In the process of cutting, especially when cutting paper, sometimes the cutting will be damaged. If it is a large area of damage, it will be more difficult to repair, but if it is a small area of damage, it can be partially cut out and re-carved a piece. When modifying, be sure to do the number in mind and then the knife.

Peel off

After modification, it is uncovered, and after finishing cutting, it is necessary to uncover the paper cutting one by one. Paper such as electrogloss and suede paper is relatively easy to lift because of its smoothness. And single rice paper and powdered paper because of its thin texture, and after damp and color treatment, it is easy to produce adhesion, resulting in difficulty in lifting. Therefore, before unveiling, it is necessary to gently rub the already carved cardboard to separate it. Then, gently lift the corner of the first piece of paper and blow with your mouth as you lift it to aid the process.

Mount (a picture)

Mounting, paper-cut works after the completion of the finished products need to be pasted together to facilitate its long-term preservation. There are two different methods, the first is to lay paper-cut flat on the paper, and then use a brush or a thin wooden strip dipped in paste, from inside to outside gradually stick, but this method can not completely stick paper-cut, and the speed is slower, its advantage is simple operation. The second method is to spread the paper-cut horizontally on the paper, and then dip the pen into the diluted paste and gently apply it on the paper that needs to be supported, taking care to avoid wrinkles on the paper brush and ensuring that the amount of paste on the brush is small. Then, quickly put the pasted side on the back of the paper cut, and then gently press it flat with your hand to ensure that the paper cut is evenly adhered to the supporting paper, and then gently lift and dry, and then clip

flat for preservation. In addition to using paste as an adhesive, white latex is also a viable option.

2.3.3 Common techniques of paper cutting folding cut

The "folding and cutting" technique in paper-cutting art is a traditional paper-cutting technique in which paper is folded and then cut to create symmetrical or repetitive patterns. This technique has been used in many cultures, especially in the art of Chinese paper cutting. Here are a few key features of the "folding and cutting" technique: **Folding paper:** The artist first folds the paper in half one or more times. The way this folds depends on the type and complexity of the pattern you want to create. For symmetrical patterns, the center is usually folded in half. **Design pattern:** On the folded paper, the artist will design the pattern that he wants to cut. Sometimes these patterns are drawn on paper in advance, especially for complex designs. **Fine cutting:** Use scissors to make fine cutting of the folded paper. This step requires a high degree of skill and precision, as any small mistake can affect the symmetry and beauty of the final pattern. **Unfold into final pattern:** After the cut is complete, the artist carefully unfolds the paper to reveal the complete paper-cut artwork. This step reveals the symmetry and complexity of the design. **Application:** The "folding and cutting" technique is widely used in the art of paper cutting, especially in the production of decorations, festive ornaments, or other traditional works of art. This technique is able to create complex and delicate patterns that give people a deep visual impression. The "folding and cutting" technique embodies the core charm of paper-cutting art - creating amazingly beautiful works through simple materials and tools. The use of this technique is not only a technical display, but also a kind of inheritance of culture and tradition.

Row cut

The technique of "row cutting" in the paper-cutting art of Zhangpu, Fujian Province, is a unique paper-cutting method, which is different from the traditional folding and cutting techniques. The main features and steps of the row cutting technique include: **Row pattern design:** In the row cutting technique, the artist first designs a series of closely arranged patterns on paper. These patterns are often repetitive and tightly laid out, creating a sense of visual rhythm and beauty. **Non-folding cutting:** Unlike the folding cutting technique, the row cutting technique usually does not require folding the paper. The artist cuts directly onto the flat paper, which requires great precision and skill. **Continuous cutting:** During the cutting process, the artist usually makes continuous and fine cuts along the edges of the designed pattern. This requires an extremely steady approach and a deep understanding of detail. **Create intricate patterns:** In this way, extremely complex and elaborate patterns can be created. The row cutting technique is suitable for making complex flowers, animals, figures or other decorative patterns. **Artistic expression:** The cutting technique is often used in Zhangpu paper-cut art to show complex storylines or traditional cultural elements, such as mythological stories and historical scenes. **Cultural significance:** The cutting technique not only shows the artist's skills, but also conveys rich cultural information and local characteristics. As a traditional art form in Fujian Province, Zhangpu paper-cut inherits and develops the local cultural heritage through this unique paper-cut technique. The technique of row cutting

occupies an important position in Zhangpu paper-cutting, which is not only a display of skills, but also a kind of inheritance and innovation of traditional culture.

Set cut

The "set of scissors" technique in the art of paper-cutting is a traditional production method, especially in the Chinese paper-cutting widely used. The characteristics and steps of this technique include: Multi-level design: The scissor technique involves the use of two or more layers of paper, each layer of paper cut out a different pattern. These patterns can be complementary to each other, or they can be independent, and together constitute a complete work. Color layers: In the set cutting technique, different layers of paper are usually used in different colors to increase visual effect and depth. The choice and combination of colors is crucial to the beauty of the final product. Fine cutting: Each layer of paper requires fine cutting to ensure accurate and beautiful patterns. This process requires a great deal of skill and patience. Layer on layer: After cutting is complete, the layers of paper are stacked in the established order. Through layering, different layers of patterns are combined to form a more complex and three-dimensional visual effect. Create three-dimensional sense: A major feature of the cutting technique is to create three-dimensional visual effects. Through the superposition of different layers, the work presents a sense of depth and layering, making the pattern more vivid and eye-catching. Widely used: Set of scissors techniques in paper-cut art has a wide range of applications, often used to create decorative paintings, holiday decorations, gifts and so on. This technique is particularly suitable for representing complex scenes or combinations of multiple elements. Set cutting technique is not only a technical display, but also the artist's creativity and imagination. Through the clever use of different layers and colors, the set cut works often show unique artistic charm and cultural connotation.

2.4 The artistic characteristics and cultural connotation of Zhangpu paper-cutting

2.4.1 Zhangpu paper-cut art features

The culture of southern Fujian is the essence of wisdom of the people in southern Fujian since the dynasties, and it is the result of the joint action of the early local culture, the Central Plains culture, the overseas Chinese culture and the Marine culture brought by the migration activities. (Wu Zhenhao, 2014) The biggest artistic feature of Fujian Zhangpu paper-cut is the graphic implication. Zhangpu paper-cut is a kind of utilitarian expectation of the public, such as bless peace, pray for happiness, health and longevity, and the ideal and vision of life. (Wu Zhenhao, 2014) Under the background of folk culture in southern Fujian, Zhangpu paper-cut has always been regarded as an auspicious symbol pattern, and is closely linked with various traditional folk activities. This paper-cut art naturally has a unique feature of southern Fujian, and is also a reflection of local wisdom. In the context of continuous social progress, paper-cutting art has gradually declined due to the gradual reduction of traditional customs and the gradual disappearance of traditional culture, but it is still a core component of the study of folk culture in southern Fujian. In the traditional daily activities, the art of paper-cutting still plays an indispensable role, so it is of great importance and long-term influence to carry out a multi-angle and in-depth study on it.

2.4.2 Form of expression

Zhangpu paper-cut art combines the roughness and exaggeration of northern paper-cut, as well as the elegance and delicacy of southern paper-cut, showing its beauty and artful. Zhangpu paper-cut mainly uses paper materials, and hollowing and cutting as its main artistic expression, so most of its paper-cut art presents a flat shape. The traditional paper-cutting art of Zhangpu mainly adopts two techniques: Yang scissors and Yin scissors. Yang scissors is the leading and Yin scissors is the auxiliary. These two techniques complement each other, emphasizing the fusion and interleaving of lines, while also highlighting the overall beauty and hierarchy of the work. In the inheritance of Zhangpu paper-cut art, Huang Su, as one of the four "flower mums", not only inherited the essence of Zhangpu traditional paper-cut, but also absorbed the artistic techniques of embroidery, thus creating a new art form. During the arrangement, elements such as feathers and petals are further enhanced by the detailed and delicate line arrangement. These fine and ingenious row cutting skills give paper-cut works a certain degree of three-dimensional visual effect. The works created by the folk artists of Zhangpu paper-cutting are full of strong emotions, life and local atmosphere, which not only shows the artists' meticulous observation ability and deep understanding, but also highlights the unique cultural characteristics of southern Fujian.

2.4.3 Implied meaning of subject matter

In the art of paper cutting, the selection of materials and images refers to the selection of symbols of objects and events. The folk paper-cutting art in Zhangpu area is a traditional craft, and most of the folk artists are women from the countryside. They usually have a variety of options when choosing their subject matter. In addition to finding suitable subjects in opera and folk tales, they also seek inspiration from interesting stories in daily life, such as folklore, opera characters, offering flowers, birds and beasts, which are the sources of inspiration for their works. Zhangpu paper-cut art is not only used for celebrations, but also widely used in funeral occasions, so the types are very rich. No matter how paper-cut art is displayed, the first task is to clarify the core idea of the work, that is, the thematic meaning of the work is crucial. Folk paper-cut art is not only a concrete form of expression of folk cultural concepts, but also an art form dominated by or even exceeding traditional images.

The paper-cut art of Zhangpu is similar to the paper-cut art of other areas of China, which emphasizes "Zhangzhang tangible and intentional". Its core idea is very clear, which can be divided into the following categories. There are many kinds of categories, including marriage and love prayer, prolonging life, inviting wealth and blessings, seeking good fortune and avoiding evil, worshipping gods and ancestors, and moral teaching.

2.4.4 Zhangpu paper cutting main style features

Due to the influence of different regions and cultural backgrounds, the folk paper-cutting art in each place has its own unique features. Zhangpu paper-cut in its composition shows a clear empty and solid, full and uniform picture, as well as smooth, simple and exquisite line style. Zhangpu's paper-cut art often uses scatter perspective technology in his works to integrate various materials together, which breaks the constraints of time and proportion. Through the form principle of symmetry and balance, it unifies the whole picture, making different combinations of

materials and different perspective points in the same picture produce unique coherence and contrast effects, thus enhancing the three-dimensional beauty of paper cutting art.

The formation of Zhangpu folk paper-cut art tradition is related to the strong maritime folk cultural background and local cultural characteristics. (Liu Li, 2021) The shaping of expression style of folk art is closely related to folk culture. Folk activities reflect people's love for life and beauty, and the unique style of folk art is often a reflection of the local folk aesthetic trend. As a folk art form, Zhangpu paper-cut is different from court art and literati art in terms of ornamental value. It is characterized by its popularity and practicality, and directly serves the daily life and production of the public, while the aesthetic value is closely connected with practicality, thus forming an artistic model of "practicality first, aesthetics second". Zhangpu paper-cut, regardless of its aesthetic characteristics and production methods, has a pure folk nature. (Liu Li, 2021) Firstly, the paper-cut art of Zhangpu in the early period was mainly created by rural women, whose works were mainly concentrated in the field of needlework. Secondly, folk art and folk life complement each other, and the paper-cut art of Zhangpu is closely related to the unique local folk life. Zhangpu paper-cut art covers a variety of subjects, whether heaven or earth, everything. These include auspicious patterns, historical backgrounds, mythological stories, totem worship, etc., which are closely linked to the seasons and rituals of daily life. The artistic quality of Zhangpu paper-cut can be compared with the folk paper-cut art all over China. Zhangpu is located by the sea and has abundant natural resources. The local people are industrious, simple and have exquisite character. In their paper-cut art creation, the characteristics of the ocean have been deeply displayed, and most of their works are related to the ocean, which also shaped the unique style of Zhangpu paper-cut, making it unique in the field of Chinese folk paper-cut art.

2.4.5 Zhangpu paper-cut representative characters and works appreciation The late "God Shear"

The art of paper cutting in Zhangpu, Fujian province, is usually inherited and developed by many local artists, whose works reflect the rich cultural traditions and unique artistic styles of the region. Through their creations, these artists have contributed to the intangible cultural heritage of China and the world. Zhangpu area folk paper-cut generations of talents, diverse styles. Early representatives of the "four great god scissors" - Chen Jin, Lin Tao, flavin, Chen Lagelai. Among them, Chen Jin and Huang Su, on the basis of inheriting the historical Zhangpu paper-cut, drew lessons from the expression techniques of traditional embroidery, and created the techniques of line-cutting, forming the characteristics and original interest of Zhangpu folk paper-cut with rich and symmetrical composition, complex and delicate lines. Lin Tao and Chen Pao Lai, based on the local area and paying attention to subjective imagination, created Zhangpu folk paper-cut art with its unique composition, primitive and abstract freehand atmosphere and naive beauty. "Four great God cut" is the outstanding representative of the southern paper-cutting art school, they are simple local farmers and fishermen, paper-cutting is not a career, but a natural hobby, conscious inheritance, a perennial quality of life. (Tong Youjun, 2019)

Chen Jin (1878-1965), female, milk name Jinniang, was born in a poor family in Suian Town, Zhangpu in the year of Renchen, Guangxu. Since childhood, I love to ream flowers. When I was 10, I learned paper-cutting and embroidery from my

mother. When I was 15, I could cut patterns for my relatives and friends to do dowry. She created many popular works, flowers, birds, fish and insects, animals and rare birds, in her cut vivid. Her paper-cut composition is dexterous, rigid and soft, thickness, rhythm harmony, very decorative and romantic. (Publicity Department of Zhangpu County Party Committee, 1999) For example, the Dragon Boat Race cleverly uses bamboo poles and a string of firecrackers to closely connect the dragon boats that are racing. "Another Harvest Year" cleverly inserts wheelbarrows and rails between the pig drawings on both sides, and this clever composition and rich imagination makes people admire. Chen Jin's paper-cut art works cover a variety of themes, including brim flowers for embroidery, bagua flowers, etc., as well as various flowers and black beasts. She is particularly good at portraying dramatic characters and people from folklore, and has written several realistic works on folk activities and celebrating the good life. Her artistic creations have been exhibited in provincial and municipal art exhibitions for many times, won many awards, and her paper-cut art works have been published in many newspapers and magazines inside and outside the province.

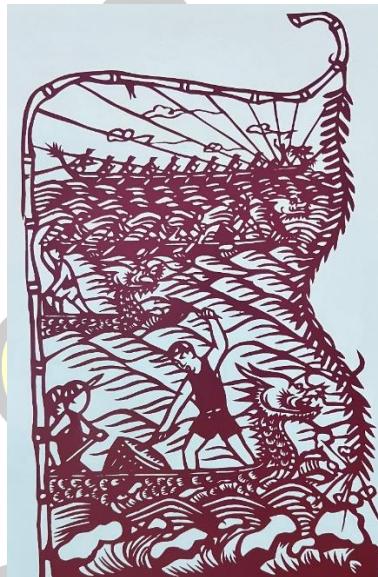


Figure 4 Chen Jin's paper-cut "Dragon Boat Race"
source: Zhangpu paper-cut art collection 2006

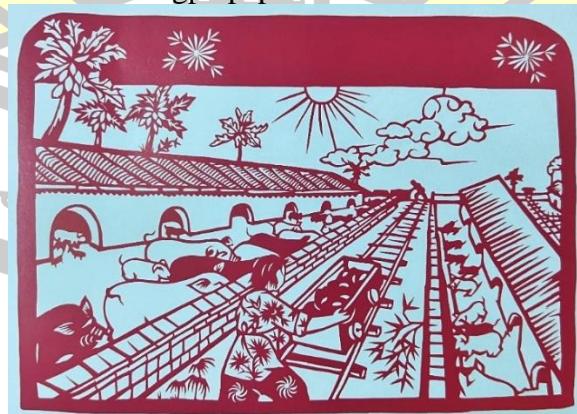


Figure 5 Chen Jin's paper-cut work "Another harvest Year"
source: Zhangpu paper-cut art collection 2006

Lin Tao, female, was born in 1903 in the remote old town of Baisha fishing village. In the face of the difficult life course, she was firm in keeping her will, stubborn and resolute, and silently endured the test of unfortunate fate. With her upright, cheerful and willing to help others, and excellent paper-cutting and embroidery skills, she won the respect and praise of her neighbors and villagers. (Publicity Department of Zhangpu County Party Committee, 1999) Lin Tao's paper-cut art shows its simple and clumsy style, rough and free style, simple and bright expression and rich imagination, which is full of strong primitive charm and immature beauty. In her works, she presents artistic images, using only a few knives, as if they were naturally formed. In the process of creation, she boldly selected various myths and legends, folk customs and birds and beasts, and exaggerated and deformed them. In terms of composition skills, she puts different time and space elements in the same time and space to show, breaking the limitation of traditional focus perspective, making the theme of paper cutting art more concentrated and typical. Although Lin Tao old man can not read, but she has extraordinary spirituality and creativity, can dig out interesting elements in daily life and refine, she boldly uses a variety of abstract decorative art treatment, showing the unique style of Fengge.



Figure 6 Lin Tao's paper-cut work "Catching Fish"
source: Zhangpu paper-cut art collection 2006



Figure 7 Lin Tao's paper-cut work "Catching Shrimp"
source: Zhangpu paper-cut art collection 2006

Huang Su, female, was born in 1908 in Zhangpu old Town coastal oil village, childhood family was poor, did not go to school, did not get the guidance of a famous teacher, but she loved life, love hometown, the pursuit of the realm of beauty, through careful observation, careful, humble to ask the elders for advice, quickly learned weaving, sewing, paper-cutting, embroidery and other skills. She became a famous girl in her teens. Later, she successively applied for Zhangpu Arts and Crafts Association and Zhangzhou Arts and Crafts Company, engaged in professional creation, and became a member of the Chinese paper Cutting Research Association. Flavin inherited the traditional folk paper-cutting techniques of southern Fujian, and has its own unique innovation, using the techniques of row cutting neat and slender, forming a symmetrical composition, rigorous modeling, delicate and elegant style. Her works are close to life, simple and natural, with a wide range of themes, such as folklore, dramatic characters, strange flowers and herbs, birds and animals, etc., in her cut god shape, full of local characteristics and strong local flavor of southern Fujian fishing town. The work experience of the arts and Crafts club has broadened her knowledge and horizons, and she has created a large number of modern works praising labor and singing the new socialist life, which have won many awards in art exhibitions at all levels. China International Exhibition Company collects nearly 50 of her works, "People's Daily", "Art World" and other newspapers published her paper-cut works. Over the years, flavin used scissors as a pen to paint red Qing, constantly exploring and pursuing. Under her influence, her sister Huang Hu, her daughter Zheng Xiaorui, and her granddaughter Zhang Zhengrong have all become famous paper-cut masters, and at the same time, she earnestly teaches apprentices and promotes the growth of a generation of paper-cut newcomers.



Figure 8 It's a paper-cut by flavin called "Hat brim Flower"
source: Zhangpu paper-cut art collection 2006

ພ້ອນ ປນ ຄີໂຕ ຂ່າວ



Figure 9 The paper-cut work "Cake Flower" by flavin.

source: Zhangpu paper-cut art collection 2006

Chen Pao Lai, female, born in 1918 in Zhangpu Old Town of a richer family, she from the primary school embroidery and cutting, practice a good hand, she cut fireworks, hat flower, baguanhua and other embroidery samples loved by the neighborhood women, has become well-known paper-cut expert. Since the 1950s, she has participated in paper-cutting training and seminars held by the county Cultural Center, and has become a member of the Chinese folk paper-cutting Research Association and the Zhangpu Folk Art Research Association. In the long-term practice of paper-cutting and embroidery creation, her paper-cutting skills and creative techniques gradually mature, forming a unique artistic style. His works are exaggerated and simple, primitive and healthy, sincere and natural, simple and beautiful, and exude a strong flavor of the villagers. For example, in the work "My family's cattle", the shepherd boy and the cattle are looming in the flowers, and the lines are perfectly connected, which is very ornamental. "Harvest" will spring ploughing, autumn harvest labor scene, celebrating the harvest festive scene and flowers and birds, livestock are concentrated in a eight diagrams pattern, breaking through the limitations of time and space, reflecting rich imagination and dexterous creative techniques. She controlled the length of some as embroidery base collar flowers, tobacco flowers, shoulder flowers, etc., especially like to cut a variety of birds, livestock, aquatic and insects. Relatives and friends travel or go abroad to visit relatives, often bring her paper-cut works as gifts. Over the years, her paper-cut works have participated in domestic art exhibitions at all levels and have been well received.



Figure 10 Flavin's paper-cut work "Harvest".
source: Zhangpu paper-cut art collection 2006



Figure 11 Flavin's paper-cut work "My family's cattle"
source: Zhangpu paper-cut art collection 2006

Living leader

Chen Qiuri, female, born in April 1948, is the representative inheritor of the national intangible cultural heritage paper-cutting project. Chen Qiuri, born in Zhangpu, the famous hometown of paper-cut art, is a new generation of folk paper-cut artists. Her paper-cut art has both the traditional foundation and the characteristics of The Times. Her works often adopt the modeling technique of "things within things", cleverly and tightly cutting the images of plants and animals in different time and space into the outline structure of the main image, producing an image group with you in me and you in me. Chen Qiuri has been out of the country many times, and his paper-cut works "sending agricultural machinery to the mountain village at night" and "Early dawn photos" have a perfectly symmetrical composition, smooth and changeable lines, and fine cutting. Chen Qiuri's works combine Yin and Yang, line and surface foil, skilful knife, delicate style, giving people a fresh and elegant aesthetic. There is a saying that "one side soil and water nourish one side", Zhangpu has been out of a group of folk paper-cutting artists since ancient times, Chen Qiuri is one of the outstanding contemporary. Chen Qiuri is the lucky one of The Times, when she was a child, she followed her aunt, aunt paper-cut play, fourteen years old when she was still in the county experimental primary school to read the fifth grade was

selected to participate in the county cultural center paper-cut training, and talent emerged and could not be returned.

From the works, it is not difficult to see that Chen Qiuri's paper-cut style is different, its rigorous and delicate shape, rich and full image, neat and precise cutting and other features are obvious. The cats in "100 Cats Picture" have different shapes and dynamics; "Octopus" fish body has flowers, fish in the flower, octopus tentacles and water grass branches are interdependent, you have me, I have you, fully express the meaning of people looking forward to a happy life.



Figure 12 Chen Qiuri's paper-cut "One Hundred Cats"

source: Zhangpu paper-cut art collection 2006

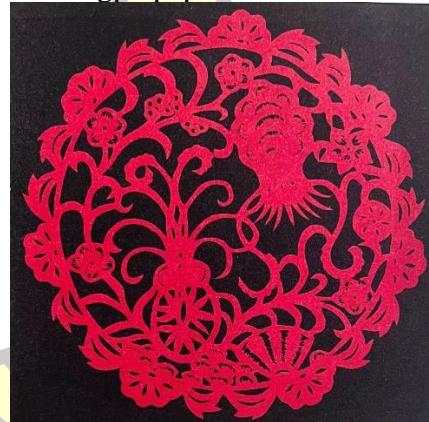


Figure 13 Chen Qiuri's paper-cut "Octopus"

source: Zhangpu paper-cut art collection 2006

Hot star

Gao Shaoping is a new generation of Zhangpu paper-cutting artists. Gao Shaoping's father, Gao Qianhou, is a professional art officer of Zhangpu County Cultural Center, and her mother is an actor of the county troupe. The good family cultural atmosphere laid the foundation for her future artistic road. She studied with the older generation of paper-cutting artists, such as Lin Tao and Huang Su, and her works created in her youth have been exhibited internationally. (Lin Shuyu, 2016) After a long time of artistic practice, Gao Shaoping has absorbed the artistic skills of painting, thus creating a large number of high-quality art works. Gao Shaoping's works cover a variety of subjects, from traditional, Marine and modern. In traditional subjects, flowers, birds, fish and insects are the main elements, while in modern subjects, characters, history and major events dominate.



Figure 14 Gao Shaoping's paper-cut work "Double phoenix Peony"

source: Zhangpu paper-cut art collection 2006

Zhang Zhengrong is also a representative of the new generation of Zhangpu paper-cutting artists. Zhang Zhengrong is a librarian of Zhangzhou Art Museum in Fujian province. She is the granddaughter of Huang Su, a paper-cutting artist of the older generation. She has participated in many domestic and international competitions and won awards. (Lin Shuyu, 2016) Zhang Zhengrong was invited to Sydney, Japan, Portugal, South Africa and other countries for cultural exchanges, and successfully spread Zhangpu paper-cut art overseas. Her work is characterized by injecting new cultural depth into traditional themes and reinterpreting them with her unique artistic expression.



Figure 15 Zhang Zhengrong's paper-cut works "Mandance to welcome the Fifteenth National Congress"

source: Zhangpu paper-cut art collection 2006

up-and-comer

Zhangpu paper-cut emerging and growing, such as Ouyang Yanjun (Fujian Province intangible cultural heritage paper-cut project representative inheritor), Li Xiaoyan (Zhangzhou intangible cultural heritage paper-cut project representative inheritor) and You Jinmei, Chen Yanrong, Lu Shurong and other Zhangzhou second batch of intangible cultural heritage paper-cut project representative inheritors, are constantly growing. They will represent the end of Zhangpu folk paper-cut art. Among the above paper-cutting newcomers, Ouyang Yanjun inherited the unique cutting techniques of Zhangpu paper-cutting and created the original long cutting techniques, which made her paper-cutting more smart and active, graceful and moving. Ouyang Yanjun's main representative works in recent years include "Minnan wearing lamp feet", "Year after year Good and high", "diligent and Kangjie" and so on.



Figure 16 Ouyang Yanjun's paper-cut works "Tiger Tiger Alive"
source: Zhangpu paper-cut art collection 2006

2.5 A summary of the value of Zhangpu paper-cutting and local wisdom

2.5.1 The value of Zhangpu paper-cut

The formation of Zhangpu folk paper-cut art tradition is related to the strong maritime folk cultural background and local cultural characteristics. (Liu Li, 2021) The shaping of expression style of folk art is closely related to folk culture. Folk activities reflect people's love for life and beauty, and the unique style of folk art is often a reflection of the local folk aesthetic trend. As a folk art form of local wisdom, Zhangpu paper-cut is different from court art and literati art in terms of ornamental value. It is characterized by its popularity and practicality, and directly serves the daily life and production of the public, while the aesthetic value is closely connected with practicality, thus forming an artistic model of "practicality first, aesthetics second". Zhangpu paper-cut, regardless of its aesthetic characteristics and production methods, has a pure folk nature. (Liu Li, 2021) Firstly, the paper-cut art of Zhangpu in the early period was mainly created by rural women, whose works were mainly concentrated in the field of needlework. Secondly, folk art and folk life complement each other, and the paper-cut art of Zhangpu is closely related to the unique local folk life. Zhangpu paper-cut art covers a variety of subjects, whether heaven or earth, everything. These include auspicious patterns, historical backgrounds, mythological stories, totem worship, etc., which are closely linked to the seasons and rituals of daily life. The artistic quality of Zhangpu paper-cut can be compared with the folk paper-cut art all over China. Zhangpu is located by the sea and has abundant natural resources. The local people are industrious, simple and have exquisite character. In their paper-cut art creation, the characteristics of the ocean have been deeply displayed, and most of their works are related to the ocean, which also shaped the unique style of Zhangpu paper-cut, making it unique in the field of Chinese folk paper-cut art.

Paper cutting is never an ordinary art, it is closely related to the folk customs and social life in the agricultural era. (Liu Li, 2021) It not only inherits the essence of the way of heaven, but also is closely connected with the atmosphere of the earth, full of vitality and fun, but also carries the simple feelings and deep emotions of the general public, so it plays an irreplaceable role in People's Daily life. Firstly, as an intangible heritage culture, the important link lies in the inheritance and development. Through research and analysis, it is concluded that Zhangpu paper-cut art is a collection of local knowledge and experience, social folklore and living environment. Zhangpu paper-cutting tool is different from the north paper-cutting, choosing a scissors shape that is more suitable for local residents, because of the humid living environment, the priority is to use rice paper with good moisture-proof performance. In terms of techniques, local artists combined local experience data to create the "line cutting" technique. In terms of content and meaning, it mainly focuses on the living conditions of local residents, social folklore, folk beliefs, and the beautiful vision of local residents for the future based on their living conditions. These aspects are full of the results of local wisdom. Therefore, Zhangpu paper cutting is a representative of the local wisdom collection in Zhangpu County, Fujian. When inheriting and developing, it is of great significance to pay attention to the inheritance and development of the contained local wisdom. Zhangpu paper-cut art is called Zhangpu paper-cut art because it is based on the local wisdom of Zhangpu. In the process of inheritance, excessive pursuit of innovation and synchronization of global knowledge, weakening the presentation of local wisdom will lose the essence of Zhangpu paper-cut art. The continuity of local wisdom must therefore be a priority. Secondly, local wisdom has an important value in Zhangpu paper-cut art. The birth of the folk paper-cut art tradition in Zhangpu is closely related to its profound maritime folk culture and local cultural characteristics. Folk activity is the concrete expression of people's love for life and beauty, and the unique style of folk art is often a reflection of local folk aesthetic trend. Folklore activities and folklore aesthetics are not only the external manifestation of local wisdom, but also the local wisdom such as Zhangpu paper-cutting art and Zhangpu folk life are interdependent and co-existing. Zhangpu paper-cut art has a close connection with the local custom and life, and forms an inseparable whole here. The local wisdom of Zhangpu paper-cut art occupies a crucial position.

Through the appreciation and analysis of the works of Zhangpu paper-cut representatives, we can find that Zhangpu paper-cut, like other folk arts, is not only an art, but a local wisdom. It is a living art and practical art spontaneously created by fishermen in Zhangpu in the process of conquering nature and improving the environment to meet the needs of life. With the progress of society and the evolution of culture, Zhangpu paper-cut has gradually changed from simple practical value and folk value to aesthetic function-based artistic creation, and the dissemination of Zhangpu folk customs, beliefs and customs is still the core of its creation. The promotion of urbanization and modernization has accelerated the transformation of Zhangpu paper-cut from folk consumer goods to commodities, and has become an important medium for cultural exchanges at home and abroad.

2.5.2 Local wisdom of Zhangpu paper-cut (common symbols, unique symbols)

Characteristics of Zhangpu paper-cut, Fujian Zhangpu paper-cut is a unique school of traditional Chinese paper-cut art, is the collection of local wisdom in Zhangpu, Fujian, with the following significant characteristics: First, unique local style: Zhangpu paper-cut has distinct local characteristics, which combines the cultural elements and local characteristics of Zhangpu area in Fujian province, and is different from paper-cut in other areas in pattern design and style. The patterns and themes of Zhangpu paper-cut are usually deeply influenced by the local natural environment and folk culture. Zhangpu area is close to the sea, so there are often Marine elements in paper cutting, such as fishing boats, waves, sea creatures and so on. Express the local residents' yearning for a better life, and look forward to the fishermen going to sea can be smooth and full of success. At the same time, local agricultural activities, such as farming and harvest scenes, are often depicted in paper cuts (Chen,2018). They all reflect the reality of local life and reflect the lifestyle of local residents. Second, rich subject matter: the subject matter of Zhangpu paper-cut is very wide, including traditional folk stories, myths and legends, natural landscapes, daily life scenes and so on. The diversity of these themes reflects the rich cultural heritage and folk traditions of the region. Third, delicate craft: Zhangpu paper-cut is very delicate and delicate in the craft, the cutting technique is accurate, and the processing of details shows the superb handicraft level. Zhangpu paper-cut emphasizes the fluidity of lines and the dynamic sense of patterns in style. Compared with paper-cut in other regions, the lines of paper-cut in Zhangpu are softer and more rounded, and the pattern design tends to show dynamic rather than static, giving people a vivid feeling (Li&Wang,2020). Zhangpu paper-cutting artists show great precision when cutting lines. Both subtle curves and complex patterns can be precisely cut out, demonstrating the artist's superb skill and strict attention to detail (Li,2021). In terms of handling details, Zhangpu paper-cutting artists are able to show amazing details and textures in a very small space, such as the texture of flower petals, animal hair, etc., which require extremely high manual skills and patience (Wang&Chen,2019). Fourth, the use of color: Unlike some other areas of paper cutting mainly use monochromatic paper, Zhangpu paper cutting will use multi-color paper in some works to create a more colorful visual effect. Although traditional paper cutting is mostly red, Zhangpu paper cutting is richer in the use of color, sometimes using a variety of colors of paper to create a more colorful and vivid visual effect. This use of multi-color paper cutting is a significant feature that distinguishes Zhangpu paper cutting from other regions (Zhang,2019). Cultural and educational value: Zhangpu paper-cut is not only an art form, but also a carrier of cultural transmission. It is often used to educate the younger generation about traditional stories, history and folklore. Festivals and celebrations: In Zhangpu and other areas, paper cutting is often used to decorate families and public Spaces, especially during the Spring Festival and other important festivals, to add a festive atmosphere. Inheritance and innovation: While retaining traditional skills, Zhangpu paper-cutting artists continue to innovate and integrate modern elements to make this ancient art form full of new vitality. While inheriting traditional skills, Zhangpu paper-cutting artists continue to innovate. They integrate modern design elements, such as modern

architecture, transportation, etc., making traditional paper-cutting art closer to modern life, and also reflecting the transition and integration between tradition and modernity in Zhangpu area (Huang,2021). As a traditional art form, Zhangpu paper-cut not only shows the local characteristics and cultural connotation, but also contributes a valuable part to the intangible cultural heritage of China and even the world. The common element symbols in Fujian Zhangpu paper-cut art not only include figurative animals and plants or cultural symbols, but also include some specific patterns and patterns, which have unique symbolic meaning and aesthetic effects in paper-cut. It is also a condensation of local wisdom, the basic patterns of which include:

Crescent pattern: The crescent pattern is common in Zhangpu paper-cut, usually in the shape of a half-moon or curved hook. Crescent is a crescent shape pattern composed of curved lines of different lengths, because of its length and size can be used independently and can be combined, so it will often appear in paper-cut works. This pattern is often used to decorate edges or fill in gaps, creating a sense of rhythm and visual fluidity. These patterns not only increase the beauty and complexity of paper-cut works, but also enrich its symbolic meaning. General Yin cut, mostly used to show clothes, eyebrows, back, flowers and so on. The method of cutting paper crescent is very simple, the scissors inserted in the middle of the pattern, and then cut along the edge of the arc. Because the crescent itself is a symmetrical figure, it can be either a single cut or a folded cut.



Figure 17 lune
source: Zhangpu paper-cut art collection 2006

Sawtooth cutting: sawtooth cutting is also called "beating teeth", it is one of the most representative and difficult techniques in the art of paper cutting, delicate hair should not be cut. Superb paper-cutting artists can cut 40 hairs on a centimeter long paper, which is usually used to show the fur and feathers of animals, as well as the texture of flowers, leaves, and human hair, etc., and can also better show the layer and three-dimensional sense of objects. Row cutting is a unique technique in Zhangpu paper-cutting, in which paper is cut into a series of closely arranged thin stripes. This

pattern creates a sense of dynamic and layering visually, making the work more vivid. This pattern is also often used to represent water flow, clouds or other natural elements in Zhangpu paper cutting. Cutting sawtooth is to first cut a straight line or arc according to the pattern, then the left hand to support the paper, the right hand to cut, the cutting tip is on the left index finger, cut out a small triangle on the right side of the straight line or arc as the starting point of the sawtooth, cut from right to left, when cutting, the cutting tip can not leave the index finger, the index finger with the movement of the cutting tip move around, "move the paper without moving the cutting", The size of the zigzag is related to the amplitude of the left hand movement, and it takes long-term practice to achieve the same size and even left and right.



Figure 18 Sawtooth cutting

source: Zhangpu paper-cut art collection 2006

Round grain: Round grain is widely used in paper cutting. It can be used alone, such as showing the eyes of characters, buttons of clothes, etc., and can also rely on different arrangements to achieve a variety of decorative effects. The production method of the round grain method: the left hand supporting the paper, the right hand holding the scissors, the cutting tip into the center of the circle space, according to the size of the required round cut counterclockwise, the edge of the cut circle should be equal to the center point, the line should be smooth, smooth, and leave no stubble.



Figure 19 Round grain

source: Zhangpu paper-cut art collection 2006

Moire: Moire is common in Zhangpu paper-cut, used to express the sky or as a substrate for other patterns to increase the depth and layer of the work. In traditional Chinese culture, clouds are often called auspicious clouds, because of the diversity of clouds in nature, so there are many kinds of moire in form, common moire are: cloud hook, line moire, Ruyi moire, cloud moire, layer moire and so on. In the shearing method, moire can be divided into Yang shearing and Yin shearing. When the main body is dominated by Yang scissors, the moire is cut by Yin, and when the main body is dominated by Yin scissors, the moire is cut by Yang. Moire production method: paper-cutting from the inside of the line into the cut, the direction from right to left cut, scissors do not move, the left hand to turn the paper, pay attention to uniform strength when cutting, the line turn to be natural and smooth. When cutting moire with complex structure such as clouds and stratus clouds, it is necessary to cut from the inside of the cloud to the outside, because the moire has many curves, so it needs to be cut carefully.

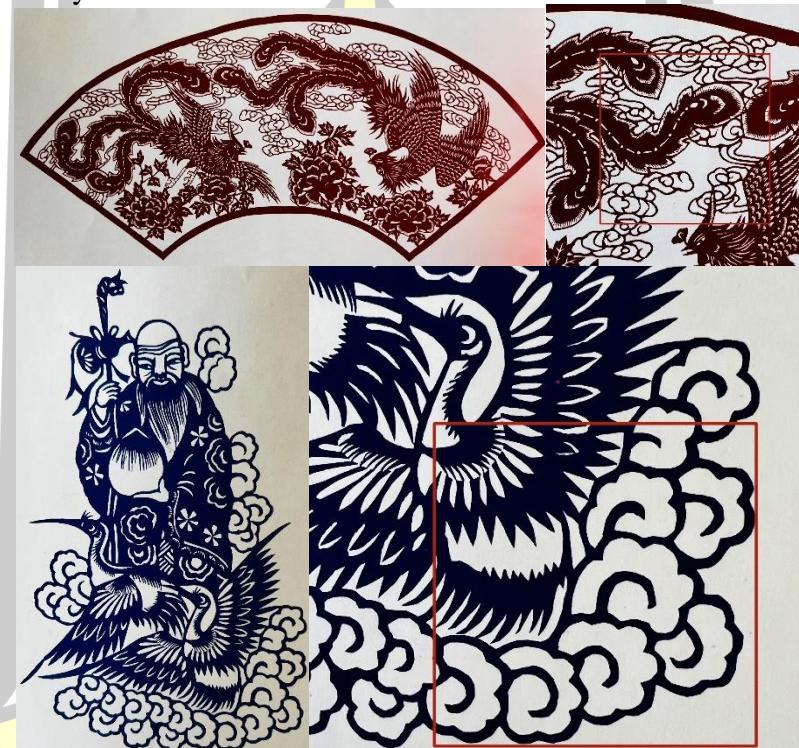


Figure 20 Moire

source: Zhangpu paper-cut art collection 2006

Water pattern: Wave pattern is often used to show the fluctuation of the water surface, full of dynamic, reflecting Zhangpu as a coastal area of the sea dependence and reverence. Water pattern and fish, aquatic plants, legendary characters combination, because the water in the form is constantly changing, paper cutting techniques can be roughly divided into static water pattern, fish scale water pattern, wave water pattern, waterfall pattern. Water pattern in the application process, generally will not appear alone, it is composed of a number of patterns repeated, paper-cutting process to be cut from inside to outside layer by layer, the line of water pattern and moire line as the same curve is varied, requiring the strength to be balanced when cutting, the paper should be gentle.



Figure 21 Water pattern

source: Zhangpu paper-cut art collection 2006

Willow leaf pattern: Willow leaf pattern is formed by two arcs of the same length, showing the shape of willow leaves. Used for flowers, leaves and other decoration. The paper cutting method of this pattern is similar to the crescent grain, cut from the middle blank, cut from right to left, requiring smooth lines and simplicity.



Figure 22 Willow leaf pattern
 source: Zhangpu paper-cut art collection 2006

2.5.3 Zhangpu paper-cut art local wisdom inheritance and development

Local wisdom is the knowledge acquired by a group of people in a particular area or place through a series of activities and then passed down orally from generation to generation. Local wisdom itself includes not only knowledge, but also life values. The authors of Zhangpu paper-cut are mainly rural women, and their creations only belong to the category of needlework. In the creative group of paper cutting art, the main group is the vast number of rural working women, when they are five or six years old girls, have seen or follow the flower to learn paper cutting. Some women will treasure their own paper-cut patterns, as a family heirloom passed on to their daughters and daughters-in-law, the meaning of those paper-cut patterns of prosperity, peace and luck, happiness and prosperity, health and longevity, passed down from generation to generation, enduring. In this way, the art of paper-cutting is passed from generation to generation through the form of "sitting flower". Along with the inheritance of paper-cutting art, traditional folk concepts are also passed on from generation to generation. This way of transmitting local wisdom is the original way. Although this way of transmitting effectively retains the local characteristics of Zhangpu paper-cutting local wisdom, the single inheritance process directly affects the scope and depth of the inheritance. It is very easy to cause the limitation of local wisdom inheritance, and the lack of innovation to adapt to The Times. Therefore, the influence of paper cutting art in Zhangpu early period was relatively weak, and only existed in Zhangpu County and the surrounding areas. Only from the late 1950s to the

mid-1970s, Zhangpu paper-cut art received the attention and attention of the national government, and the government began to intervene. At the same time, a group of professional painting workers participate. Under the guidance of the "a hundred flowers bloom, bring forth the new" policy, artists have inherited and developed the art form of paper-cut, creating paper-cut works that express new socialist people and new things, and have expanded in subject matter and form. Zhangpu paper-cut has a new change different from the traditional techniques, which promotes the innovative development of paper-cut. ; In 1989, Zhangpu County established the Folk Art Research Association, which was listed as one of the 100 demonstration sites of Fujian Province Fangcao Plan. The Culture and Sports Bureau and Cultural Center were responsible for the management of the research association, and supported the transmission, help and lead of the four paper-cut echelons of the old, middle, young and young. In 1993, Zhangpu County successfully declared "the Hometown of Chinese Folk Art (paper cutting)". Zhangpu grassroots cultural workers not only actively rescue, collect and organize folk paper-cut works, but also hold folk paper-cut classes in the cultural hall, hold folk paper-cut exhibitions, mobilize the enthusiasm of creators and disseminators, and push Zhangpu paper-cut to the whole country. In 2009, Zhangpu Paper-cut was included in the UNESCO intangible Cultural Heritage as the sub-project of "Chinese Paper-cut". The transmission of local wisdom is directly influenced by Government policies, and proactive Government policies will accelerate the transmission and development of local wisdom. Now Zhangpu paper-cut not only makes the local wisdom of Zhangpu, but also begins to go out of the country and go to the world, becoming one of the representative traditional cultures in China

In this process of inheritance and development, this researcher summarized several changes in the development of local wisdom. The first is the inheritance method. The inheritance of local wisdom in Zhangpu paper cutting has evolved from the early family style, oral style, and "sitting flower m" style to the current inheritance method that integrates training courses, entering classrooms, and mass education, increasing the breadth and depth of inheritance. It promotes the development of local wisdom. Secondly, the creation content and form of Zhangpu paper-cut art have also changed. Due to the change of inheritance mode, the inheritance group has changed. Many practitioners with fine arts majors have entered the paper-cut industry, thus expanding the creation content and form of Zhangpu paper-cut art. Including from the early paper-cut works of abstraction, exaggeration to the present realistic, early paper-cut works of small size limitations, to the present paper-cut works of imposing grand works. Finally, the role of paper cutting art is also changing, from the early practicality and folklore to the modern decorative. Whether it is the generation of local wisdom or the inheritance and development of local wisdom, it is based on the comprehensive effect of local folk customs and government policies. It is an inevitable direction and process of development.

2.5.4 Sustainable management of local wisdom value of Zhangpu paper-cut art Policy support and international recognition

From June 19 to July 5, 1954, the Chinese Artists Association held the first National folk paper-cut exhibition in the Palace Museum, which became a milestone in the inheritance and development of Chinese folk paper-cut art. It has had a great impact on the rescue, protection and development of folk paper-cut art all over the country."

(Chen Jing, 2008) In 1956, at the Fujian Folk Arts and Crafts Exhibition, the exhibition hall displayed the works of paper-cutting artists such as Chen Jin and Huang Su. In 1959, the Zhangpu cultural department held a paper cutting rookie training class to train a group of paper cutting artists, and Zhangpu gradually set off a boom in paper cutting. Since the 1980s, Zhangpu County has increased its financial support for paper-cutting, held the first paper-cutting art festival, Lin Tao's 100th birthday celebration and other activities, and successively published "Fujian Zhangpu paper-cutting Collection", "Chen Qiuri paper-cutting collection" and "Lin Tao paper-cutting art research collection". The policy support of the government is the key factor for the sustainable development of Zhangpu paper-cut art. From the initial discovery and protection of paper-cutting artists, holding training courses, etc., to being named the "Hometown of Chinese Folk art" and being listed in the national and world-class intangible cultural heritage, these policies and recognition have provided necessary protection and resources for it. International recognition has not only improved the global visibility of Zhangpu paper-cut, but also brought it wider attention and financial support, which is essential for its long-term sustainable development.

Protection and innovation of cultural heritage

As a kind of traditional art, the sustainable development of Zhangpu paper-cut art depends on the protection of its historical and cultural value. The historical and cultural value it contains is also the accumulation of local wisdom. At the same time, in order to maintain its relevance, artists need to innovate and incorporate modern elements into traditional techniques so that they retain both traditional characteristics and modern aesthetics. By establishing a paper-cutting training center and inheritance demonstration site, Zhangpu County not only protects this art form, but also develops it into a local cultural industry with local characteristics, which reflects the innovation and commercial utilization of traditional culture to some extent.

Education and community involvement

Continuous education and community participation are essential for the inheritance of Zhangpu paper-cutting art. Through training courses in art galleries and schools, not only the skills are passed on, but also the interest and awareness of the art of paper cutting is cultivated. By cultivating a new generation of artists and enthusiasts, Zhangpu paper-cutting art has been continuously passed on and developed in the local community.

The combination of art and economy

The transformation of Zhangpu paper-cut art into a local cultural industry not only provides economic support for artists, but also helps to enhance the local economy. Through the sale of paper-cut artworks as decorations, gifts or tourist souvenirs, investment and interests in this art form can be increased, thus guaranteeing its long-term development.

CHAPTER III

Summarization of community assets in Zhangpu County

Community Capital is a concept in humanistic sociology that refers to the various resources and assets within a community that promote mutual assistance and support among community members and enhance the cohesion and sustainability of the community. The concept of community capital has been widely discussed in the field of humanities and social sciences. To be specific, These assets include, but are not limited to, physical assets (such as schools, parks, transportation facilities), human assets (such as residents' skills and knowledge), social assets (such as community groups and networks), cultural assets (such as local traditions and cultural heritage), economic assets (such as local businesses and employment opportunities), and natural assets (such as natural environments and green Spaces) (Kretzmann & Mcknight, 1993). The identification and effective use of these assets can help communities develop themselves while improving the quality of life of their residents. These resources held by the community are called community capital. Using community capital is an empowering concept because the first step is to look at what the community has, rather than what they lack and need. The "community assets" in this study refers to the community unit in Zhangpu County, Fujian Province, focusing on the cultural assets, physical assets and natural assets in the community. Cultural assets include folk customs, traditional festivals, languages and scripts, religious beliefs, members' trust and dependence, and conventional values. Physical assets include community historical buildings, representative buildings, public venues, infrastructure, road traffic, etc. Natural assets include natural scenery, scenic spots and so on. By looking for community assets in Zhangpu County and using these assets as materials for Zhangpu paper-cut pattern design, it is a meaningful attempt to combine traditional art with modern innovation. The first thing to do is to investigate and identify Zhangpu community assets. Researchers collect community assets through literature review, interviews and other methods as follows.

3.1 Cultural assets of Zhangpu County

3.1.1 The way of life of the people of Zhangpu County

Zhangpu County is located in the south of Fujian Province, which belongs to the typical hilly and mountainous terrain. This landscape results in a large amount of agricultural activity having to be carried out on sloping land, which presents particular challenges for crop cultivation and soil management. Slope agriculture is prone to soil erosion, which affects soil fertility and crop yield. Zhangpu County is located in the subtropical monsoon climate zone, with a warm and humid climate. Such climatic conditions are conducive to the growth of crops such as citrus fruits and vegetables, especially for agricultural products such as pomelos and citrus. However, the monsoon climate can also bring heavy rainfall, which can exacerbate soil erosion problems in hilly agricultural areas. At the same time, with the advancement of urbanization, the reduction of cultivated land area has become an important problem facing Zhangpu County and the whole Fujian Province. The loss of arable land not only affects agricultural production, but also poses a threat to farmers' livelihoods. The agricultural development in Zhangpu County of Fujian Province is facing a

challenge. But the special geographical environment, but also the development of Zhangpu County fisheries and Marine agriculture has a congenital advantage, Zhangpu County is located in the southeast coast of China, facing the Taiwan Strait, this geographical location makes it has a wealth of Marine resources. This provides natural advantages for the fishery, including wide fishing areas and diverse Marine life. Zhangpu County is located in the subtropical monsoon climate zone, with mild climate and sufficient precipitation. Such climatic conditions are conducive to the growth of Marine life and are particularly important for fishing and Marine agriculture. The rich Marine biodiversity of Zhangpu County provides a wide range of fishing objects. Marine farming, such as the farming of fish, shellfish and seaweed, has also developed here. The geographical environment of Zhangpu County provides important natural resources and conditions for fishery and Marine agriculture. However, in order to ensure the sustainability of these resources, the Marine environment needs to be properly managed and attention needs to be paid to reducing the negative impacts of anthropogenic activities on Marine ecosystems.

3.1.2 Local Folklore in Zhangpu County

The Torch Holding Festival in Zhangpu County, Fujian Province, is a local traditional festival, mainly held by the local Zhuang ethnic group. This festival is usually held on the 24th day of June of the lunar calendar, and has a profound national cultural background and historical significance. It is a folk activity popular in Futan Town and Maping Town in Zhangpu County, Fujian Province. It has a long history and rich folk culture connotation. It has the meaning of praying for the prosperity of the family, and is intended to celebrate a year's harvest and plan for the next year. Dongban Village in Zhangpu County is especially representative. The people of Higasaka celebrate the Lantern Festival, and express their festive mood and vision for the future life, and pray for good weather, peace and prosperity in the coming year. The main activities of the Torch Festival include torch parade, dragon dance, lion dance, folk song and dance performances and various other folk activities. The climax of the festival is a torch parade at night, where residents carry torches and walk through the streets of their towns and villages to pray for peace and a good harvest. This traditional custom symbolizes warding off evil spirits and praying for good luck and light. At about 6 o 'clock, when everything was ready, the torches were lit, and hundreds of Higasaka Dai villagers, wearing helmets and cloth shoes, or holding torches, or carrying a dozen or so statues of the Buddha such as the Emperor Sheng, gathered together and marched onto the streets with great force and started the folk customs patrol. The whole team with the "cool umbrella" and the statue "Marshal Zhao Fu" as the leader, the torch and the rest of the statues as the dragon body, the main god Baosheng Emperor accompanied the tail, formed a long team of about 700 meters long, winding around the village. During the event, the fireworks were loud and the torches were glowing, and the whole scene was spectacular. In the celebration, wherever the torch team went, the onlookers cheered and set off all kinds of fireworks and actively participated. Countless fireworks illuminate the night sky, everywhere is red, colorful, to the countryside to add infinite joy atmosphere. Some children also held smaller torches and happily participated in the celebration, and the whole event was lively. According to legend, the custom of "lifting fire" in the village of Higasaka has a history of at least 600 years. For more than 600 years, the Dongban Village "fire lifting" folk activity team has basically walked the same route, they need

to walk around the mountain paths, streets, alleys, ancestral temples, lasting more than two hours. In the local, "fire" commonly known as "light", has the meaning of praying for the prosperity of the family. "Lighting lights" is meant to celebrate the year's harvest and plan for the coming year. The people of Higasaka celebrate the Lantern Festival, and express their festive mood and vision for the future life, and pray for good weather, peace and prosperity in the coming year.



Figure 23 The Torch Holding Festival
source: Baidu Encyclopedia 2006

The Torch Festival is not only a celebration of national culture, but also a way of community unity and cultural inheritance. During the festival, villagers visit each other and participate in celebrations together, enhancing the cohesion and identity of the community. The Torch Holding Festival in Zhangpu County is an important reflection of the multi-culture of Fujian Province, showing the unique ethnic customs and rich cultural traditions of the region. The festival provides an interesting and important perspective for the study of ethnic culture and folk traditions in southern China.

Temple fairs and festivals in Zhangpu County reflect the rich local cultural heritage and folk beliefs. These events, which usually combine religious ceremonies, folk art performances and community gatherings, showcase Zhangpu's deep historical and cultural heritage. Spring Festival Temple Fair: During the Spring Festival, Zhangpu County will hold a temple fair, which is a traditional way of celebration. The fair usually includes temple sacrificial activities, folk art performances (such as lion and dragon dances), handicraft displays and local cuisine. It is a time for family reunion and good luck in the New Year. Dragon Boat Race during the Dragon Boat Festival, a dragon boat race is held in Zhangpu County. This is a traditional water competition, not only a sports competition, but also a way to commemorate the ancient patriotic poet Qu Yuan. During the dragon boat race, spectators along the coast gather to watch the race and enjoy traditional food such as zongzi. Mid-Autumn Festival celebrations: During the Mid-Autumn Festival, people in Zhangpu County will hold celebrations, including watching the moon, eating moon cakes, lantern display and so on. It is a festival of reunion and sharing, reflecting the importance Chinese people place on family and harmony. Tomb-sweeping Day activities: Tomb-sweeping Day is a traditional ancestor worship festival, Zhangpu County residents will visit the graves of their ancestors to express the memory and respect of their ancestors. The festival is also a good time to go out in spring and enjoy the natural beauty. Temple Sacrifice activities: On certain days in Zhangpu County, local temples

will hold sacrificial activities, and residents will participate in the worship, praying for peace, health and prosperity. These temple fairs and festivals are not only a place for entertainment and socializing, but also an important way to inherit and display Zhangpu County's traditional culture and folk beliefs. Through these activities, Zhangpu County's history, culture and community spirit are maintained and promoted.



Figure 24 Dragon dance
source: Baidu Encyclopedia 2003



Figure 25 trance
source: Baidu Encyclopedia 2003

Zhangpu held the Sacred King of Kaizhang Sacrificial ceremony and the folk festival of the county, the Sacred King of Kaizhang Sacrificial Ceremony is a memorial to the sacred king of Kaizhang Chen Yuanguang, a general in the Tang Dynasty, considered to be the pioneer and protector of Zhangzhou (including Zhangpu County). This activity is not only a memorial to historical figures, but also a kind of local history and culture inheritance. By holding the ritual ceremony, Zhangpu County residents have the opportunity to re-examine their own history and maintain respect and memory for their ancestors, which is crucial to maintaining cultural continuity. Sacrificial ceremonies usually include a series of traditional rituals and activities, such as worship, parades, folk art performances, etc., which are themselves part of the intangible cultural heritage. By organizing such activities, the protection and inheritance of intangible cultural heritage can be promoted, especially those traditional skills and rituals that may gradually disappear with the passage of time. "The purpose of carrying out the folk activity of the Saint King Tour is to commemorate the great achievements of the sages in opening Zhangzhou county and benefiting the people's livelihood, and to express the worship and nostalgia for the

Saint King Chen and his successors." Li Hongkun, secretary-general of Zhangpu Weihui Temple Council, said that at the same time, it will be conducive to promoting cross-strait economic and cultural exchanges, and will be conducive to inspiring the people to carry forward excellent folk culture, inherit the spirit of protecting the country and loving the people and working hard to open Zhangzhou. During the event, 15 statues of sages such as Chen Yuanguang, Lady Gong Yi, and generals were divided into 15 floats surrounded by 87 military flags, accompanied by the sound of drums and artillery salutes, along the main streets of the county. Citizens and businesses along the street stopped to watch and pray together. The sacrifice to the sacred king of Kaizhang is not only a memorial to a historical figure, but also a symbol of Zhangpu people's recognition and respect for their own cultural roots. Such activities help to shape and strengthen the local identity of Zhangpu County and its residents, making residents feel proud, and showcasing Zhangpu's unique cultural characteristics and community spirit to the outside world. This sense of local identity is an important cornerstone of community cohesion and social stability, as well as a key driver of local cultural tourism and economic development.



Figure 26 Temple fair
source: Taiwan Economic Daily News

The "God lifting activity" in Zhangpu County, Fujian Province is a traditional folk religious and cultural activity, which is mainly held in some specific festivals or celebrations. For example: Spring Festival, Dragon Boat Festival, Mid-Autumn Festival, temple fair or sacrificial day. This activity is usually related to Taoist or folk beliefs and shows the local people's worship and reverence for the gods. The core of the activity is to carry out the gods (or sedan chairs) enshrined in the temple or altar and parade them along a specific route by believers or villagers. It was seen as a symbol of the gods visiting their people and blessing peace. Along with the activities, there are usually traditional artistic performances such as drum music, dragon and lion dances, and opera performances to add to the festive atmosphere. The active participation of local residents, both as volunteers to carry God and as people watching and participating in the celebration, demonstrated a strong sense of cultural participation and community cohesion. People who take part in the worship of the gods usually pray for the blessings of family peace, business success, and academic success. This activity is not only the embodiment of religious belief, but also an important part of local culture and historical tradition, which is of great significance for the inheritance and promotion of local culture. In Zhangpu County and other areas, the activity of raising gods is not only a religious activity, but also a community

activity, which strengthens the connection between community members, and is also an important way to inherit and carry forward the local traditional culture. Through such activities, new generations can learn about and participate in their cultural heritage, enhancing the continuity and vitality of regional culture.



Figure 27 trance

source: Baidu Encyclopedia 2003

The Hungry Ghost Festival, celebrated in Zhangpu County, Fujian Province, is a festival deeply rooted in local cultural traditions, reflecting the traditional Chinese ghost festival culture and the remembrance and respect of ancestors. The Hungry Ghost Festival, also known as the Ghost Festival, Obon Festival, usually held on the 15th day of the seventh lunar month, is an important festival in East Asian culture, mainly used to worship ancestors and worship the dead, in order to express the memory of the ancestors and the wish to rest in peace. This festival is celebrated in many parts of China, but in Fujian province, such as Zhangpu, it has a unique way of celebrating and cultural significance. In Zhangpu, the seventh lunar month is called "Pudu Month". Many people will hold sacrificial activities between the first day of July and July 30 to remember their ancestors and be careful. Zhangpu old customs attach great importance to the Hungry Ghost Festival. According to folklore, the first day of July "opens the prison gate" (southern Fujian called "open alley"), the magistrate pardons the crime of the dead to return home, and all kinds of dead ghosts in the Yin realm have to beg for food in the Yang, until the 30th "closes the prison gate" (southern Fujian called "closed alley"). As early as June 29, every family lights a lamp in front of the door and offers ghosts to rice. The Hungry Ghost Festival in Zhangpu County is not only a day to commemorate ancestors and the dead, but also an opportunity to showcase local culture and promote community unity. The festival reflects the deep understanding of life and death, karma and family bonds in traditional Chinese culture. At the same time, it is also an important moment to inherit and carry forward local traditional customs. Celebrating the Hungry Ghost Festival in Zhangpu County is not only a commemoration of traditional culture, but also a reinforcement of family, community and traditional values in modern society. Through these activities, people not only express the memory of their loved ones, but also strengthen the bonds and cohesion within the community, while passing on the essence of traditional culture to the next generation.



Figure 28 The Hungry Ghost Festival
source: Baidu Encyclopedia 2006

Worship of the Lord of Heaven, also known as worship of Tai Sui or worship of the Lord of Heaven, is an important part of local traditional culture, reflecting deep Taoist cultural influence and folk beliefs. This activity is usually held on specific days in the lunar calendar, especially during the Spring Festival, with the meaning of driving away evil spirits and praying for peace and good luck. Worship of God is done in the family unit. On New Year's Eve, in the early hours of the morning, some families will prepare a rich tribute, burn the folded "gold and silver", worship God, and then set off firecrackers. Worship of God of Heaven in Zhangpu and other Fujian areas is not only a religious activity, but also an important way to promote family and community unity. It embodies the respect and inheritance of traditional culture, and is also one of the important social and cultural activities in the New Year.



Figure 29 Worship of the Lord of Heaven
source: Hong ShiYin 2012

The worship of the Lord of Heaven (also known as the Lord of Heaven or the Jade Emperor) is an important part of local religious beliefs and cultural activities in Zhangpu, Fujian Province. The Jade Emperor is regarded as the supreme God in Chinese Taoism, representing the supreme divine power of the universe. The Jade Emperor's birthday is usually considered to be the ninth day of the first lunar month. On this day, many religious areas and people will hold various celebrations to show their respect for the Jade Emperor. Kueh and Fa Kueh are special offerings with strong local characteristics. Turtle kueh is usually red with a tortoise-shell pattern on

it, symbolizing longevity and good luck; Fa kueh represents prosperity and harvest. These offerings not only express people's respect for God, but also convey people's good wishes for the future life. On the birthday of the Jade Emperor, families and Taoist temples will hold sacrificial activities, prepare incense candles, flowers, fruits, traditional food and other offerings, chant sutras, offer incense and other ceremonies to show their devotion to the Jade Emperor. The celebration of the Jade Emperor's birthday in Zhangpu is not only a reflection of Taoist beliefs, but also a microcosm of Zhangpu's rich cultural and social life, demonstrating the Zhangpu people's respect for tradition and religion and their pursuit of a harmonious society.



Figure 30 The worship of the Lord of Heaven
source: Baidu Encyclopedia 2006



Figure 31 Turtle birthday cake
source: Baidu Encyclopedia 2006

3.1.3 Zhangpu County local cultural elements L

Bamboo horse drama is an ancient and rare folk traditional drama. It has a history of more than 1,300 years since its formation in the Tang Dynasty. It is one of the traditional local operas of the Minnan language family, and it is also a provincial intangible cultural heritage. It is most popular in Zhangpu. For this reason, Zhangpu County has been named the hometown of Chinese folk culture and art bamboo horse play. From January 2023, Zhangpu County bamboo Opera (Hsiang Opera) heritage protection center began to go deep into major scenic areas for public welfare performances. Tianfu Tea Museum is one of the venues.



Figure 32 Bamboo horse drama

source: Baidu Encyclopedia 2009

The puppet art in Zhangpu, Fujian Province is an important part of Chinese traditional culture. It belongs to the Chinese traditional puppet show. Zhangpu puppetry originated in Zhangpu County, Fujian Province, with a long history and unique artistic style. This kind of puppetry is usually performed with brightly colored and elaborately made puppets, with traditional music and singing, telling various historical stories, folklore or stories from modern life. The characteristics of Zhangpu puppet art include: puppet making: puppets are usually carved from wood, with rich facial expressions and gorgeous clothes, reflecting the traditional clothing and aesthetic concepts of Fujian region. Performance style: The performance style of Zhangpu puppet show is unique, with flexible movements and vivid expressions, which can well express dramatic emotions and story plots. Music and singing: The music and singing that accompany the puppet performance is usually the traditional music with local characteristics, which not only adds to the drama, but also is an important part of the culture of the Fujian region. Cultural inheritance: Zhangpu puppet show is not only a form of entertainment, it also carries rich historical and cultural information, and is an important part of the intangible cultural heritage. Social impact: As a traditional art form, Zhangpu puppet show is of great social and cultural significance in the local community. It is not only a way to entertain the public, but also an important way to inherit and carry forward national culture. Puppet artist Professor Yang Sheng and other artists have led delegations to visit abroad many times to spread the art.



Figure 33 The puppet art in Zhangpu

source: Baidu Encyclopedia 2006

Chaozhou Opera, Zhangpu Chaozhou Opera is a local opera form in Fujian Province, China, which belongs to a school of Chaozhou opera. Chaozhou opera originated in Chaoshan area. It is a kind of local opera of Han nationality popular in Chaoshan area of Guangdong Province and southern Fujian Province. On the basis of the traditional tidal opera, Zhangpu tidal opera has integrated the local cultural

characteristics of Zhangpu and formed its own unique style. Zhangpu Chaozhou Opera mainly uses Chaoshan dialect to perform, which makes Zhangpu Chaozhou Opera with distinctive regional characteristics. The music and singing of Zhangpu Chaozhou Opera also reflect the characteristics of Chaoshan music, with beautiful melody and rich local characteristics. It combines the diversity of Teochew music with the softness of Minnan music to create a unique artistic effect. The performance style of Zhangpu Chaozhou Opera focuses on expression and body language, and the performers' performances are delicate and expressive, which can deeply express the inner world of the drama characters. The repertoire of Zhangpu tidal opera is diverse, with both traditional historical stories and themes reflecting modern life, showing rich cultural connotation and spirit of The Times. As a traditional form of local drama, Zhangpu Chaozhou Opera plays an important role in local society, not only as a part of cultural entertainment, but also as an important way to inherit and develop local culture. With the development of The Times, Zhangpu Chaozhou Opera is constantly absorbing new elements, making this traditional art form more colorful.



Figure 34 Chaozhou Opera
source: Baidu Encyclopedia 2006

3.2 Material and cultural assets of Zhangpu County

3.2.1 Zhangpu County historical sites

The Zhangpu Confucian Temple, also known as the Confucius Temple, is a place of worship dedicated to and commemorating the ancient Chinese Confucian thinker Confucius. Located in Zhangpu County, it was built in the fourth year of Qing Yuan in the Southern Song Dynasty (1198) and rebuilt in the second year of Hongwu in the Ming Dynasty (1369). Now only Dacheng Hall remains. Dacheng Hall has three wide faces and five deep ones. There are five square stele of Ming and Qing Dynasty in Dacheng Hall. During the maintenance in 1964, the wooden columns were replaced with stone columns, and the remaining appearance was basically preserved. In August 1979, it was announced by the Zhangpu County People's Government as the Zhangpu County cultural relics protection unit, and in May 2006, it was approved and announced by The State Council as the sixth batch of national key cultural relics protection units. As an important cultural landmark, Zhangpu Literary Temple not only carries profound historical and cultural values, but also is a part of the spiritual life of local residents. It is not only a window to understand traditional Chinese culture and Confucianism, but also an important place for local residents and tourists to learn and experience traditional Chinese culture. (Red Tourism Resources: zhangpu Literary Temple - Tourism Zhangpu (Zhangpu.gov.cn), 2013)



Figure 35 The Zhangpu Confucian Temple
source: Zhangpu County People's government website

Yianbao, also known as Yiancheng, is a traditional settlement located in Zhangpu County, Fujian Province, China. It represents the unique traditional houses and settlement forms in Fujian Province. Yianbao has unique historical and cultural values, reflecting the traditional architectural style and community lifestyle of the Fujian region. Huang Xingzhen, who helped the imperial court recover Taiwan in the early Qing Dynasty, was built in the twenty-sixth year of Kangxi (1687), located in the village of Huxi Township, Zhangpu County, about ten minutes' drive from Zhaojiapu. The wall is 1200 meters in circumference, 6.7 meters high and 2.2 meters thick, and the area is the same as Zhaojiapu. But the Yianbao plane is locked and the Zhaojiapu plane is square. Apparently, Yian Fort was built after Zhao Jiapu, so the two fortresses are also called sister fortresses. On the wall of Yianburg, there are all the horse tracks made of strips of stone, and a 2-meter high female wall is built outside the horse tracks. The whole city has 365 crenels. Stone steps are set up every 50 meters inside the city. The corner of the city is equipped with enemy towers 3 meters deep and 3 meters wide for observation and shooting. The city has four gates, the east, south and west three gates of the tower, imitation of a ship, the story of the city main yellow earthquake platform. A moat was dug from the south gate to the west gate, with a width of 10 meters. Visitors with knowledge of ancient military affairs commented that Yianbao was a microcosm and living fossil of ancient Chinese cities.



Figure 36 Yianbao
source: Baidu Encyclopedia 2006

Zhaojiapu, located in the She Township of Zhangpu County, Fujian Province, is 0.5 kilometers around, 38 kilometers away from the city pass, 90 kilometers away from Zhangzhou city, is the Southern Song Dynasty emperor Minchong County king Zhao Ruohe (Song Taizu Zhao Kuangyin's brother Zhao Kuangmei 10th grandson) exile refuge of an ancient castle, commonly known as Zhaojiapu. In 1985, Zhaojiapu was listed as the second batch of provincial cultural relics protection units. Zhaojiapu, located in Shuoshan Mountain, Huxi Township, Zhangpu County, is a castle built by the descendants of the Zhao and Song dynasties in the 28th year of Wanli in the Ming Dynasty (1600). It is reported that Zhao Ruohe, king of Minchong County of Zhao and Song Dynasty, escaped from the battle of Yashan in Guangdong Province in the early Yuan Dynasty and arrived in Zhangpu, where he lived in hiding. In the Ming Dynasty, Zhao Fan, the tenth descendant of Zhao, successively served as governor of Cizhou and deputy minister of inspection and investigation in Zhejiang Province, and returned to China. When the Japanese invasion was raging along the coast, he decided to build castles to defend the former capital of the Northern Song Dynasty, and to place his thoughts on the ancestor Emperor Ye. Wanli forty-seventh year (1609) Fan Zi Zhao Yi expanded the outer city. Zhaojiapu is known as "five miles and three cities", and its layout is purposeful, everywhere imitating the former capitals of the Song Dynasty. The castle has two walls inside and outside, the outer city is a triad earth wall with a stone base, 6 meters high, 2 meters wide, 1,082 meters in circumference, building four gates. The east gate horizontal plaque engraved "Oriental giant obstacle", the south gate engraved "Dan Ding Zhong Xiang", the west gate engraved "high and high win". Zhaojiapu is not only a historical landmark in Zhangpu County, but also an important place to study traditional architecture, family history and local culture in Fujian. Such settlements are often rich in historical stories that reflect aspects of past social life.



Figure 37Zhaojiapu

source: Baidu Encyclopedia 2015

Lantingzhen Mansion, located in Zhangpu County, She township Dingtan Village new town natural village. It was built at the end of Kangxi by LAN Tingzhen, the governor of Fujian Naval Division in Qing Dynasty, and was also the former residence of LAN Yuanmei, the grandson of LAN Tingzhen, the governor of Jiangnan Naval Division. The scale is huge, the layout is rigorous, the building group sits west to east, the main building covers an area of about 5722.69 square meters. The Lentingzhen Mansion displays typical southern Fujian architectural style, including exquisite brick, wood and stone carvings. The buildings are beautifully decorated and demonstrate a high level of craftsmanship. In May 2013, it was announced as the

seventh batch of national key cultural relics protection units. As a typical ancient building in southern Fujian, the Lantingzhen Mansion is unique in architectural style, cultural significance and historical value. As the former residence of historical celebrities in Zhangpu County, Lantingzhen Mansion is an important window to understand the history and culture of southern Fujian, especially in the study of local history, architecture and culture.



Figure 38 Lantingzhen Mansion
source: Baidu Encyclopedia 2015

Zhangpu Red Building is located at the end of the church of the new Road, Suian Town, Zhangpu County. It is the old site of the third Army of the Central Red Army East Road Army. At that time, the military headquarters of the Third Army was located in the building, and military Commander Xu Yangang, political commissar Ge Yaoshan, and Nie Rongzhen, then general political commissar of the Eastern Road Army, also came to Zhangpu to guide the struggle to create the Soviet area and lived here.

The church at the end of the new road, the old site of the third Army of the Central Red Army East Road Army, was built in the early 19th century, and was originally a female school teaching building run by the Christian Church. It was built of red brick blocks, also known as the Red Building, and was a two-story brick and wood structure with a construction area of 598 square meters. After liberation, Xinlu Wei Church was nationalized and returned to the church after the implementation of the religious policy after the reform and opening up. In 2007, it was repaired by the government and rented to the church, and was opened as the Zhangpu County Revolutionary History Memorial Hall. In April 1984, Zhangpu Red Building was announced by the Zhangpu County People's Government as the Zhangpu County Cultural relics protection unit, and in June 2011, it was announced by the Party History Research Office of the Fujian Provincial Committee of the Communist Party of China as the Fujian Provincial Party History Education Base. On January 28, 2013, it was announced by the Fujian Provincial People's Government as the eighth batch of provincial cultural relics protection units.



Figure 39 Zhangpu Red Building
source: Zhangpu County People's government website

Liuao Ancient City is located in the west of Liuao Town, Zhangpu County, Zhangzhou City, Fujian Province, China, at the southern end of the Liuao Peninsula, Liuao city wall has been listed as a cultural relic protection unit in Fujian Province in 2001. Liuao ancient city was founded in the Ming Hongwu twenty-one year (1388), Zhou Dexing, the marquis of Jiangfu, went to Fujian to build coastal defense, and set up a thousand household on the Liuao Peninsula, because it was built halfway up the mountain and surrounded by open areas, such as "giant Ao Dai Yue", so it was named "Liuao". Liuao city wall is made of long stone masonry, showing an irregular triangle, the residual height of the city wall is 5 meters. There are five watergates in the city. Qi Jiguang had rate "Qi family army" stationed here. (Yang Shuiming. Liuao Ancient City: Listen to the sound of history. Quanzhou Evening News.[2011-08-09].) Liuao Ancient City, as a historical heritage of Zhangpu County and even Fujian Province, is an important window to understand the past of the region. It not only represents the historical socio-economic situation, but also embodies the local cultural and architectural characteristics. Liuao Ancient City plays an important role in preserving and inheriting local history and culture.



Figure 40 Liuao Ancient City
source: Baidu Encyclopedia 2010

Sanguan Emperor Temple is located in Shaping Village, Shes Township, Chiling, Zhangpu County. It is a magical temple in the rain Chading of Shaping Village. It is called: Sanguan Emperor Temple, also known as Sanjie Gong Temple, was built in the Xuande period of the Ming Dynasty (1430) and rebuilt in the middle of the Kangxi period of the Qing Dynasty. So far, there are 8 stone tablets preserved in Ming and Qing dynasties. Covers a total area of nearly 60 acres, the total construction area of about 500 square meters. However, the main temple building is strange, rare at home and abroad, for the dome pavilion, an area of less than 40 square meters, God occupies less than 2 square meters. It is said that the rain Jisanguan Emperor is located in the Fuding gold hole, temple site God point, can be called

supernatural. If you can't build a temple, it will be burned once it is built, and it has been tried and tested. God only allowed stone altars and empty walls. Formed a custom, spread to the present day, every year attracts many tourists from home and abroad to visit this temple (incense), now has become one of the key tourist attractions in southern Fujian.



Figure 41 Sanguan Emperor Temple
source: Zhangzhou tourism network

Weihui Temple is located in Ximiao Village, the southern foot of Xichenling in the western suburb of Zhangpu County, the south end of Sui'an Industrial Development Zone, and the northwest side of National Highway 324. It is a temple dedicated to Mazu (Our Lady of heaven), the temple is north to the south, backed by the Golden monkey chair Mountain, beside the Luxi River, the front is a plain and fertile field, the distant Liangshan ninety-nine peaks such as a column of halberds, surrounded by green trees, beautiful mountains and rivers, beautiful scenery. Typical southern Fujian architecture may include elaborate carvings, brightly colored decorations, and traditional building layouts. Department of county-level cultural relics protection units. It is one of the important tourist attractions in southern Fujian.



Figure 42 Weihui Temple
source: Baidu Encyclopedia 2010

Wushi Mazu Temple, located in the old town town, which enshrines a statue of Mazu (Heavenly Mother). Mazu is a sea god widely worshipped in China's coastal areas, especially in Fujian and Taiwan, and is regarded as a god to protect the safety of navigation and the well-being of fishermen. As an important local religious and cultural center, Wushi Mazu Temple carries profound religious beliefs and local cultural characteristics. The Wushi Mazu Temple is one of the few in the world made of agarwood. The temple looks at the sea. The scenery is beautiful. On Mazu's birthday (March 23 in the lunar calendar) and other important festivals, the Wushi

Mazu Temple will hold grand celebrations to attract many believers and tourists. Every year, a large number of Taiwan compatriots come to worship and exchange views. As an important cultural heritage of Zhangpu County and even Fujian region, Wushe Mazu Temple reflects the deep religious belief and Marine culture in southern Fujian region. Mazu belief plays an important role in local social life and is closely related to the daily life of residents, especially for communities that depend on the sea for their livelihood.



Figure 43 Wushi Mazu Temple
source: Baidu Encyclopedia 2010

3.2.2 Zhangpu County representative architectural landscape

Zhangzhou Binhai Volcanic National Geopark is the first batch of national geopark approved by the former Ministry of Land and Resources in March 2001. It is located in the coastal area of Qianting Town, Zhangpu County and Longjiao Township, Longhai City, covering an area of 61.34 square kilometers. It is a typical Tertiary volcanic geopark, famous for its unique volcanic landscape and geological relics. It is an important place for the study of volcanic geology and the appreciation of natural landscapes. Mainly composed of Zhangpu Xiangshan, Linjin Yu, Nanding Island scenic spot and Longhai Niutou Mountain ancient crater scenic spot, the park contains a number of volcanic cones and lava flows, showing the unique landform formed by volcanic eruptions. These volcanic remains provide important data for the history of volcanic activity in the study area. It is the only coastal volcanic geological and geomorphic scenic tourist area in China. (Zhangzhou Coastal Volcanic Landforms National Geopark_Geopark_Fujian Provincial Forestry Administration (fj.gov.cn), 2020) In addition to volcanic landforms, the park also has beaches, caves, cliffs and other natural landscapes. Zhangzhou Binhai Volcano National Geopark is not only a treasure house of geology and natural landscape, but also an important part of local culture and tourism. It plays an important role in enhancing the tourist attraction of the region, promoting economic development, and enhancing the public's awareness of natural environment protection.



Figure 44 Zhangzhou Binhai Volcanic National Geopark
source: Zhangzhou tourism network

Zhangpu Flower Expo Park, officially known as Zhangpu Flower Expo Park, is a comprehensive flower park integrating flower display, leisure tourism and horticultural science. Flower Expo Garden is located in Makou, Zhangpu County, in the center of Zhangzhou Minnan Hundred Li flower Corridor along National Highway 324. The park displays a large number of flower varieties, including local and precious flowers at home and abroad. The park provides a variety of recreational facilities, including walking paths, viewing platforms, rest areas, etc., suitable for family travel and leisure holidays. The garden also has the function of popular science education, popularizing horticultural knowledge and plant science to the public through various exhibitions and activities. During special festival periods, such as the Spring Festival, National Day, etc., the Garden will hold special flower exhibitions and cultural activities. The Flower Expo Garden not only provides a place to enjoy natural beauty and relax, but also a showcase for the local flower growing and horticultural culture. It plays an important role in promoting the development of local tourism, enhancing regional cultural taste and popularizing horticultural knowledge. It is the first batch of "Cross-Straits Agricultural Cooperation Experimental Zone" approved by the state, and the "modern agricultural Park" granted by the Ministry of Science and Technology.



Figure 45 Zhangpu Flower Expo Park
source: Zhangzhou tourism network

West Lake Park is located in the county, with Mai Shi Street in the east, Jinlu Road in the west, Longhu Road in the south, Youth Road in the north, covering an area of 230 mu (including the youth Palace and children's paradise already built), of which 140 mu land, 90 mu lake, with a circumference of 1953 meters. The park is a comprehensive cultural rest park with water system as the main landscape, with the art of ancient Chinese gardens, and various scenic spots with pavilions, pavilions, corridors, Bridges and other architectural pieces. Zhangpu West Lake has a long history, founded in the eighth year of Jiading in the Southern Song Dynasty (AD 1215), where the south of the Lushui River, the distance is winding tens of miles of Liangyue group peaks, distant mountains near the water, picturesque, "Lake Ying" is

one of the ten sights of Zhangpu. In 1995, in order to build the historical spot into a modern famous park, according to the corner of the lake, the park was designed by Professor Peng Yigang of Tianjin University, a member of the CPPCC National Committee, academician of the Chinese Academy of Sciences, and Professor Qigong of Beijing Normal University for the horizontal plaque of the West Lake Park. As an important leisure spot in Zhangpu County, West Lake Park not only provides a good place for local residents to relax and entertain, but also attracts many tourists to visit. As an important public space in Zhangpu County, West Lake Park not only provides a place for leisure and entertainment, but also an important place for social and cultural exchanges. It plays an important role in enhancing the quality of urban life, enhancing community cohesion and promoting cultural diversity.



Figure 46 Figure West Lake Park
source: Baidu Encyclopedia 2010

The Tea Expo Park in Zhangpu, Fujian Province, the full name of which is Zhangpu Tea Culture Expo Park, is a theme park dedicated to displaying tea culture and tea industry. The Tea Expo Garden is not only a tourist attraction, but also a platform for educational and cultural exchange, focusing on showing the cultivation and making process of tea, as well as the history and culture related to tea. The foundation stone of the Tea Museum was laid on January 8, 2000, and it opened on January 7, 2002. With a total area of 80 mu (5.3 hectares) and a total construction area of more than 6,000 square meters, it is the largest tea museum in the world. The four main buildings of the museum: (1) The main exhibition hall: mainly displays the history of tea, Chinese tea culture and tea production and marketing status, the tea situation of the world's major tea-producing countries and the development process of Tianfu Group; (2) Tea Ceremony classroom: On the first floor, there are professional tea art performance hall and elegant tea tasting places such as Yihe Xuan and Tea Pavilion, which serve as tea ceremony teaching. The second floor is an international conference hall with advanced facilities; (3) Japanese teahouse (Fuhui 'an) : Japanese courtyard and teahouse, with Jing Pavilion, Jian Pavilion and Jing Pavilion representing three different styles of Japanese teahouses of different times; (4) There are three exhibition halls in the painting and Calligraphy Museum (Hall Stone Zhai). The main exhibition hall displays the museum's collection of calligraphy and painting, and the activity exhibition hall has an artificial theme painting and painting exhibition from time to time; On the second floor, there is a chat and friendship hall to hold pen meetings from time to time. Hall Shi Zhai mainly shows and sells all kinds of hall stone, carving and other handicrafts. There are also scenic facilities such as Hanting,

Tangshan, Songqiao, Yuantang, Minghu, Qingchi, Lanting Qu Shui, Wuren Tea Garden, Mingfeng stone carving, Shiyuan Tea Garden and so on. With a quiet and natural environment, it is a tea culture garden integrating academic research, cultural inheritance, education and entertainment. Visitors can gain tea knowledge, know tea, understand tea art and inherit tea culture in the entertainment. Zhangpu Tea Expo Park is not only a window to showcase local tea culture and tea industry, but also an important platform to promote cultural tourism and education. It helps to raise public awareness and interest in tea culture while promoting local economic development.



Figure 47 The Tea Expo Park
source: Baidu Encyclopedia 2010

3.3 Natural resource assets of Zhangpu County

3.3.1 The natural environment of Zhangpu

Zhangpu County, Zhangzhou City, Fujian province. It is located between $117^{\circ}24'$ and $118^{\circ}12'$ east, and between $23^{\circ}29'$ and $24^{\circ}20'$ north. It is located in the south coast of Fujian Province, southeast of Zhangzhou City, east and southeast of Taiwan Strait, south to west with Dongshan County across the sea, southwest with Yunxiao County, west and northwest with Pinghe County, north and northeast with Longhai District, with a total area of 1981 square kilometers. (Zhangpu County Local Chronicles Compilation Committee, 2018)

County negative mountains face the sea, the terrain is high in the northwest, low in the southeast, a step spread. The landforms include mountains, hills, valleys, basins, plains, beaches, peninsulas, bays (埯 ao), islands and reefs, etc. It is a subtropical monsoon climate with four distinct seasons and abundant rainfall. It is rich in natural resources, including mountains, forests, rivers and Marine resources. In particular, the Marine resources are rich and the coastline is long. Due to its diverse topography and climatic conditions, Zhangpu County has rich biodiversity and complex ecosystems.

The terrain of the county slopes from northwest to southeast, with low mountains and hills in the northwest and sea in the southeast. The landform is successively low mountain - hill platform - valley basin - coastal plain - beach, reef, mountains and rivers are in the same direction as the terrain. The coastline stretches and twists for 216 kilometers, ranking second in Fujian Province. Zhangpu County is an extension of the Bopingling Mountains, in the upper Luxi river valley, divided into Liangshan Mountains and Shiping Mountains, sent out of the Zaoshan Mountains. Liangshan Mountain Range lies more than 150 kilometers southwest of the county, the western half is the boundary mountain of Zhangpu and Yunxiao counties, and the

eastern half is the watershed between the central basin of the county and the southern coastal area. There are many peaks in the Liangshan Mountains, and there are "ninety-nine peaks of Liangshan", mainly: Dongzai tip, Quemu Mountain, Shi Shi tip, Diamond Mountain, Lotus peak and so on. The Shiping Mountain range lies in the northwest of the county. Its peak is 1006 meters above sea level. It is the highest peak in Zhangpu County. Shiping Mountain range is lofty and steep, there are 7 mountains above 800 meters above sea level, there are 5 above 900 meters, mainly: Shiping peak, Hawksmao Mountain, Wuya Mountain, Moding Mountain, Haiyun Mountain and so on. Zaoshan Mountain range is Shiping mountain branch Xiban Wuya mountain - Changqiao Hengnei mountain from the county central hinterland to the coastal extension, the north and south sides of the mountain formed two basins. The main mountains are: Jiao Diao tail mountain, turtle Mountain, Chaotian Ma Mountain, Zao Mountain, South peak and so on. The terrain of the county slopes from northwest to southeast, and there are plains and basins of different sizes between the mountains, among which there are many hills.

The economy of Zhangpu County is based on agriculture and fishing, and in recent years, tourism and manufacturing are also developing. Zhangpu County grows a variety of crops, including rice, vegetables, fruits, etc., especially some characteristic fruits and cash crops. In recent years, Zhangpu County has done a lot of work in promoting agricultural modernization and improving the quality and efficiency of agricultural products. Because Zhangpu is located in the coastal area, Zhangpu County has rich Marine resources, fishery has always been an important economic source. Efforts should be made to develop modern fisheries, including Marine fishing and aquaculture, in order to improve the efficiency of resource utilization and economic benefits. At the same time, Zhangpu County has a large number of natural landscapes and historical and cultural relics, such as coastal volcanic geopark, Mazu cultural scenic spot, attracting domestic and foreign tourists. In the manufacturing sector, industrial parks are being built and developed to attract investment and enterprises. Manufacturing, including light industry, machinery manufacturing, electronic products, food processing, etc., contributes to the transformation of economic structure. Zhangpu County is actively promoting the diversification and modernization of economic structure, striving to improve economic efficiency, increase employment opportunities, and improve residents' living standards. Through these efforts, Zhangpu County aims to achieve sustainable development while protecting and utilizing its natural resources and cultural heritage.

ພ້ອນ ປະ ຄີໂຕ ຂ່າວ

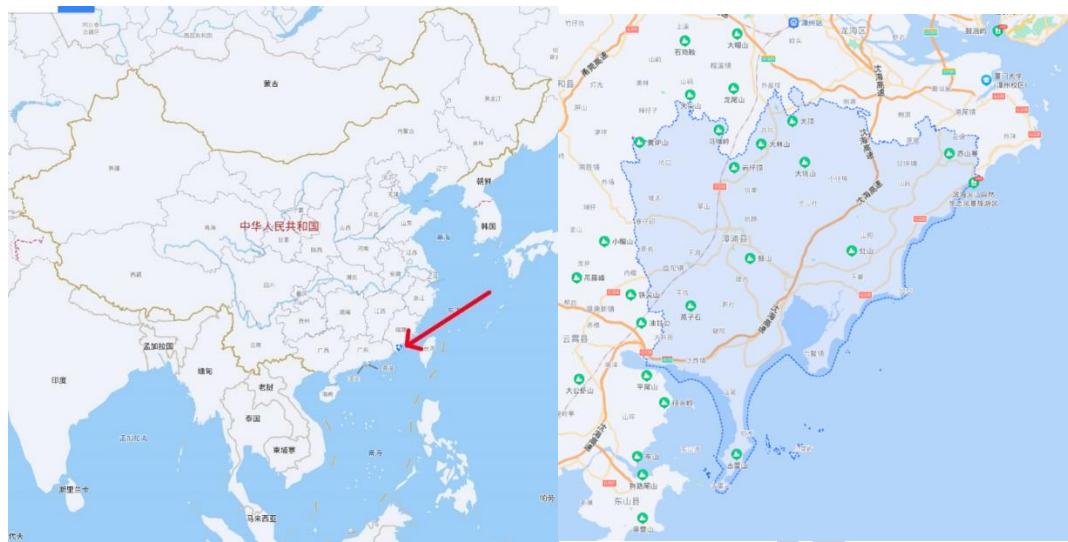


Figure 48 Zhangpu geographical location
source: Baidu map 2023

3.3.2 Representative natural landscape of Zhangpu

Gulei coastal scenic tourist area is located in Zhangpu County Gulei Peninsula east of the Caiyu islands. Shazhou, Hongyu, Jing'an, Balu Island, Caiyu, Hengyu and other twenty-three islands of different sizes from the west to the east, the sea and sky vast, rocky cliffs, from a distance, like floating on the green clouds Pengcai Xianshan. The island was formed in the geographical history of the strong geological tectonic movement, the exposed granite in the waves of wind and sand carved, gradually cut, separated into large and small granite eggs, forming a strange, different shapes of granite landforms. Among them, the Hongyu giant wind rock as the representative of the wind rock group, the world's rare wave stone, the amazing shark stone life door, fish net stone, as well as deep caves, pebbles, precipitous cliffs, five fine quality beaches. It is a comprehensive tourist destination that combines natural beauty, seaside leisure and cultural experiences. This scenic spot attracts many tourists with its beautiful coastline, rich natural resources and unique cultural background.



Figure 49 Gu lei map
source: Baidu map 2023



Figure 50 Gulei coastal scenic tourist area
source: Baidu Encyclopedia 2010

Abstract Gallery tour area is located in Zhangpu County Liuao Peninsula east Laoaya Mountain. Its east is facing the Taiwan Strait, the west across the two kilometers wide peninsula is the old town Bay, the south, the north is a stretch of nine kilometers of golden beaches and dense windbreak belt, the surrounding environment is wide, the sea and sky win. Laoaya Mountain with strange geological landform and beautiful seaside scenery, by the Chinese Academy of Sciences and other national scenic area experts as "abstract gallery", the surrounding beach is also considered to be "real gold Coast", is "tourism resources boutique". The scenic spot is close to the Zhangyun Line of the provincial highway, only 15 kilometers away from the Zhangpu Interchange of the expressway, and only 30 kilometers away from Xiamen Island by sea. The transportation is very convenient. The planning area of the scenic area is 5000 mu, and the scenic area is centered on Laoaya Mountain, spreading between the large area of green belt and the sea, forming three major projects to the Marine erosion landscape tourist area, seaside bath recreation area and resort. Leisure tourism services such as marinas, baths, painting galleries, sea pavilion, sea view gallery, management offices, hotels and seafood restaurants are planned, forming a leisure holiday tourism area with Marine erosion landforms, sightseeing Tours and coastal baths as the theme.



Figure 51 Abstract Gallery tour area
source: Baidu Encyclopedia 2010

Linjin Island Coastal Volcanic scenic spot, north from Longhai junction Qisha Bay, through Xiangshan Peninsula, Jiangkou Bay, Queen Milk, Yanlou Mountain, Houcai Bay to the whole Weiyu Peninsula, the coastline of the scenic area is 18 kilometers long, in the scenic sea there are two magical volcanic islands - Linjin Island - Nanding Island, It has been recognized by domestic and foreign experts as an extremely rare, well-maintained and precious ancient volcanic geological geomorphic resource landscape. The coastal volcanic landform of Linjinyu scenic area has not

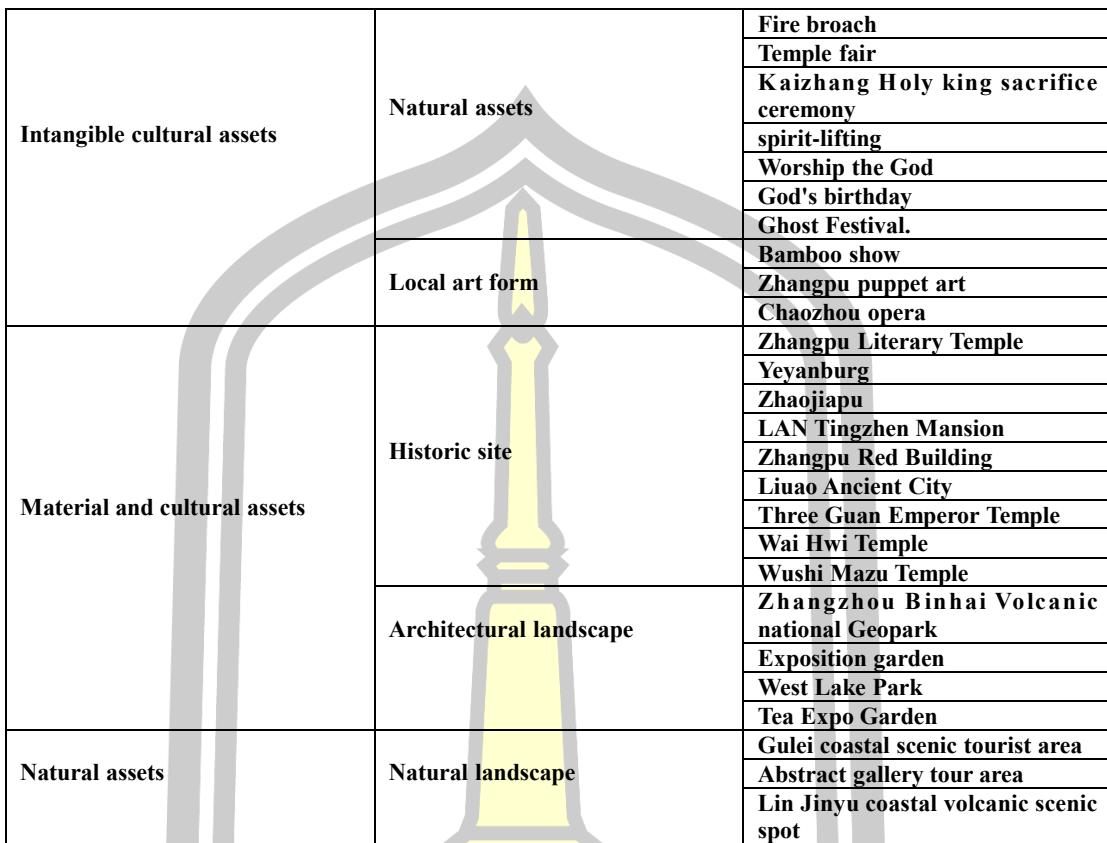
only high scientific research, science and education value, but also high tourist appreciation value. The volcanic landforms in the scenic area belong to the products formed by intermittent volcanic eruptions on land 28.61 million years ago, 15.41 million years ago, 13.2 million years ago and more than 1 million years ago in the Cenozoic New Century. There are completely exposed huge volcanic neck landscape, sea erosion lava platform landscape, basalt ball sea erosion gallery landscape, basalt lava cone group landscape, columnar basalt wave erosion cliff landscape, sea erosion buried lava landscape, sea erosion lava cave and other large-scale natural landscape. In addition to these amazing, precious, non-renewable volcanic natural features, there are amazing and comparable to Hawaii's high-quality beaches, experts identified this is a national super beach. The sand quality, water quality, beach flatness and air index of the surrounding landscape have reached excellent indicators. This is an extremely large natural bath that remains to be developed and is the "Beidaihe" in southern China. Jinyu scenic spot belongs to the subtropical Marine climate, like spring all year round, the annual average temperature is 21 degrees Fahrenheit. Linjinyu Coastal Volcano scenic spot is not only a natural beauty, but also an important part of the geological and natural heritage of Zhangpu County and even Fujian Province. It has important contributions to popular science education, ecological tourism and regional economic development.



Figure 52 Linjin Island Coastal Volcanic scenic spot
source: Baidu Encyclopedia 2010

3.4 Summary of Community Capital

According to the content of community assets in Zhangpu County collected above, it is summarized and classified into three categories: intangible cultural assets, material cultural assets and natural assets. The local assets of Zhangpu area are displayed in the form of a table. This is shown in the following table. Intangible cultural assets include local folk customs and local art forms, including: fire holding, temple fairs, sacrificial ceremonies for the sacred king of Zhangzhou, activities to carry gods, the Hungry Ghost Festival, worship of the Lord of Heaven, bamboo horse show on God's birthday of Tianyuan, Zhangpu puppet art, and Chaozhou opera. The material cultural assets include historical monuments and modern architectural landscapes, specifically: Zhangpu Temple of Literature, Yian Fort, Zhaojiapu, Lantingzhen Mansion, Zhangpu Red Tower, Liuao Ancient City, Sanguan Emperor Temple, Weihui Temple, Wushi Mazu Temple Zhangzhou Binhai Volcano National Geopark, Flower Expo Park, West Lake Park, Tea Expo Park. Natural assets are mainly natural landscape, specifically: Gulei coastal scenic tourist area, Puma Elephant Gallery tourist area, Lin Jinyu coastal volcanic scenic area.



Intangible cultural assets	Natural assets	Fire broach
		Temple fair
Material and cultural assets	Local art form	Kaizhang Holy king sacrifice ceremony
		spirit-lifting
Material and cultural assets	Historic site	Worship the God
		God's birthday
Material and cultural assets	Architectural landscape	Ghost Festival.
		Bamboo show
Natural assets	Natural landscape	Zhangpu puppet art
		Chaozhou opera
Natural assets	Natural landscape	Zhangpu Literary Temple
		Yeyanburg
Natural assets	Natural landscape	Zhaojiapu
		LAN Tingzhen Mansion
Natural assets	Natural landscape	Zhangpu Red Building
		Liuao Ancient City
Natural assets	Natural landscape	Three Guan Emperor Temple
		Wai Hwi Temple
Natural assets	Natural landscape	Wushi Mazu Temple
		Zhangzhou Binhai Volcanic national Geopark
Natural assets	Natural landscape	Exposition garden
		West Lake Park
Natural assets	Natural landscape	Tea Expo Garden
		Gulei coastal scenic tourist area
Natural assets	Natural landscape	Abstract gallery tour area
		Lin Jinyu coastal volcanic scenic spot

3.4.1 Questionnaire survey

As for the identification of representative community assets in Zhangpu County, researchers need to collect and analyze data through questionnaire survey to finally determine the representative community assets. All the collected community assets will be made into a questionnaire, each asset set 5 options, respectively: very unrepresentative, slightly unrepresentative, average, more representative, very representative. Please refer to the attachment for the questionnaire. The scores of 1, 2, 3, 4 and 5 are set accordingly. 100 questionnaires were distributed. The process of conducting a questionnaire survey and collecting data from 100 random local residents in Zhangpu County, Fujian Province, needs to be properly organized to ensure that the collected data is accurate and reliable. The data collection process is divided into preparation stage and implementation survey stage.

The preparation stage includes: Firstly, prepare the questionnaire, which adopts online and offline methods. Considering that young people are accustomed to using smart phone devices, the survey can be conducted by electronic questionnaire to shorten the survey process and improve the efficiency of the survey. Older respondents may not be good at using smart devices, so they also printed questionnaires for offline use. The second is to determine the investigators. This questionnaire is mainly conducted by the researchers of this paper. The researchers design the designated questionnaire and understand the contents and purpose of the questionnaire. Finally, the survey plan was formulated, and the survey was divided into online and offline. The online survey mainly targeted at young residents in Zhangpu through wechat platform, and about 50 people were sampled. Offline to print

questionnaires, mainly in Zhangpu County, about 50 people. The target interviewees are mainly between 20 and 60 years old.

During the survey phase, in order to ensure the authenticity of data, random sampling should be carried out in the selected areas when selecting respondents. Ensure randomness. When distributing the questionnaire to respondents, provide the necessary guidance and explanation to ensure that respondents understand each question and complete the questionnaire completely. After respondents complete the questionnaire, it is necessary to collect the questionnaire in time to prepare for subsequent data analysis.

3.4.2 Data collection and analysis

Data entry

Enter the questionnaire data into a spreadsheet and assign each participant a unique ID. For each question, enter the corresponding answer. For example, the representative of the torch holding in the intangible cultural assets is recorded respectively. As shown in the figure.

Data cleaning

Check data consistency and accuracy. For example, make sure all scores are on a scale of 1 to 5. Eliminate invalid or incomplete questionnaires. For example, if there are questionnaires that do not answer all questions, they may need to be excluded from the analysis.

Data analysis

The representativeness of each asset is averaged. And the data results are produced to generate a histogram for easy viewing and comparison, as shown in the figure.

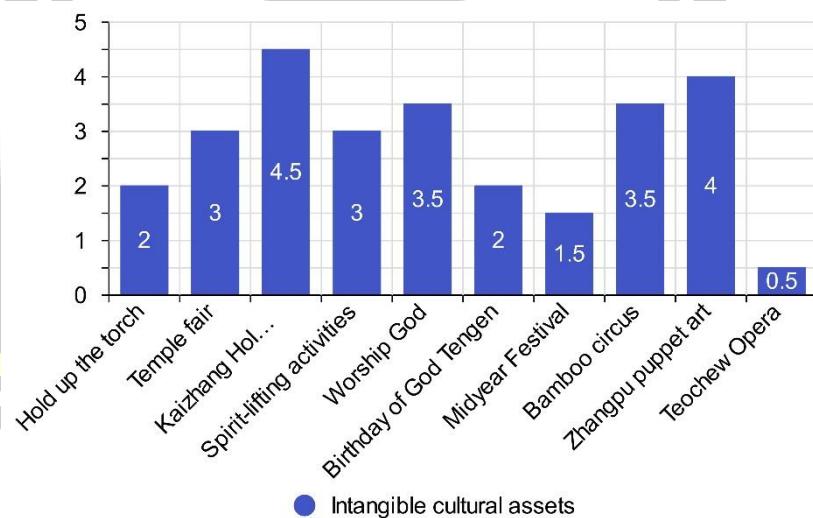


Figure 53 Representative statistics of intangible cultural heritage

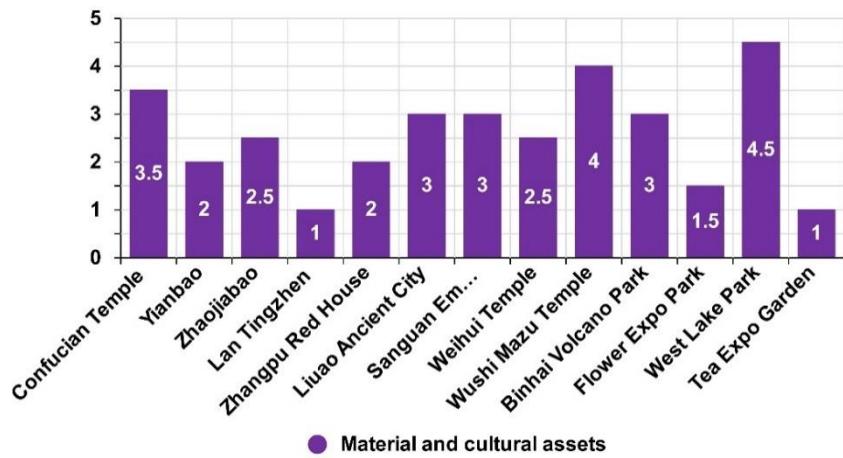


Figure 54 Representative statistics of material and cultural assets

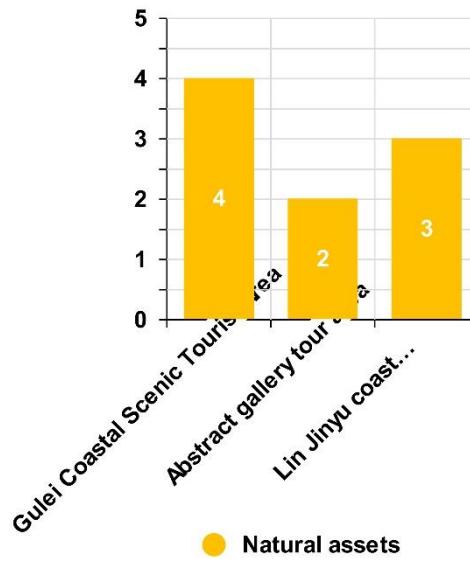


Figure 55 Representative statistics on natural assets

3.5 Conclusion

According to data analysis and sorting, we can see different asset histograms, and the most representative asset items can be visually observed through the histograms. First of all, among the items of intangible cultural assets, Kaizhang Holy King Sacrifice Ceremony ranks the top with 4.5 points, which is the most representative intangible cultural asset. Zhangpu Puppet Art ranked second with 4 points. The lowest score was 0.5 for Chaozhou opera. This shows that Chaozhou opera is the least representative. We take items greater than or equal to 4 points as representative items, including: Kaizhang Sacred King Sacrifice ceremony, Zhangpu puppet art two items. It is concluded that these two items are the most representative of intangible cultural assets.

The second is the representative histogram of material and cultural assets. Through observation, we can see that West Lake Park ranks first with 4.5 points, and Wushi Mazu Temple ranks second with 4 points. Tea Expo Garden 1 ranked the lowest and was the least representative project. We take the projects with a score of 4

or higher as the representatives of material cultural assets, including: West Lake Park and Wushi Mazu Temple, a total of 2 projects.

In the histogram of natural assets, there are 2, 3 and 4 points respectively. There are three projects in total. The most representative is Gulei Coastal scenic Area (4 points), the least representative is abstract Gallery tourist area (2 points), and the middle is Linjinyu Coastal Volcanic Scenic Area (3 points). To sum up, the representative community assets of Zhangpu County include intangible cultural assets: Kaizhang Sacred King Sacrifice ceremony and Zhangpu puppet art. Material and cultural assets: West Lake Park and Wushi Mazu Temple. Natural assets Gulei coastal scenic tourist area one. There are five items in total.

The collection and identification of representative community assets as materials for the design of Zhangpu paper-cut pattern, Zhangpu County community assets as materials for paper-cut pattern design and innovation, has far-reaching significance, not only in the artistic creation itself, but also in the community development, cultural inheritance and economic promotion and other aspects. By integrating the community assets of Zhangpu County into the paper cutting art, it is possible to create art works that both retain the traditional charm and conform to the modern aesthetic taste. This innovation can make the traditional paper-cut art closer to modern life, increase its appeal, so as to attract the interest and participation of the younger generation, and promote the inheritance of traditional art. Each paper-cut piece that integrates the assets of the local community is an expression of Zhangpu's unique culture, enhancing the diversity of culture. This diversity not only enriches the paper-cutting art itself, but also provides a window for people from different backgrounds to understand and appreciate Zhangpu culture. By recording Zhangpu's community assets through artistic creation, we are actually carrying out a cultural preservation activity. As an important form of intangible cultural heritage, the innovation and development of paper-cutting art contribute to the recording and dissemination of local history, culture and tradition, and provide a foundation for future protection and research. The innovative paper-cut art works demonstrate the uniqueness and value of Zhangpu culture, and can raise the public's awareness of intangible cultural heritage protection. Through exhibitions, workshops and educational activities, the public can directly participate in the creation and experience of paper-cut art, thereby enhancing their awareness and responsibility for the protection of cultural heritage. Innovative paper-cut art works reflect Zhangpu's natural features, cultural stories and social activities, helping to shape and strengthen the local cultural identity and brand image. Through the creation and display of paper-cut art, the public can be educated about local culture and history, and the public's awareness of art and cultural heritage can be enhanced. Participating in the creation of paper cutting art and related activities can provide opportunities for community residents and visitors to participate in local cultural construction, promote cultural democracy and social participation.

CHAPTER IV

Research on papermaking materials and techniques in Zhangpu County

4.1 Overview and steps of papermaking

4.1.1 Overview of papermaking

The history of papermaking is an important chapter in the development of human civilization, which greatly promotes the dissemination and preservation of knowledge. Papermaking originated in China and can be traced back to the Western Han Dynasty (2nd century BC). CAI Lun of China improved the technique of papermaking in 105 AD, making it a practical manufacturing technique. He uses bark, scraps of linen, old fishing nets and other materials to make paper. Papermaking gradually spread westward through trade and cultural exchanges along the Silk Road. Around the 8th century, Arabs learned the technology of papermaking from Tang captives, and it quickly spread throughout the Arab world. Papermaking was introduced to Europe in the 12th century, first appearing in Spain and Italy. Subsequently, paper manufacturing gradually replaced traditional parchment in Europe. In the 19th century, with the advancement of the Industrial Revolution, the papermaking process was significantly improved. Around 1820, Louis Nicolas Robert of France invented the paper machine for continuous paper production, which greatly improved the efficiency of paper making. At the same time, people began to use wood as the main raw material for pulp, which further reduced the cost of paper. In the 20th century, the paper industry continued to evolve, including improvements in chemical pulp and mechanical pulp technology, as well as more efficient bleaching and recycling techniques. Increased environmental awareness has prompted the paper industry to explore more sustainable raw materials and production methods, such as using recycled paper and non-wood fibers. Today, the rise of digitalization and electronic media has had an impact on the paper industry, leading to changes in paper demand. At the same time, the increasing demand for environmentally friendly and sustainable paper making methods is driving continuous innovation and improvement in paper making technology. The invention and development of paper technology not only promoted the spread of culture and science, but also had a profound impact on the organization of society and economic activities.

The art of paper cutting is directly dependent on the development of paper making. Paper as the main material of paper-cut, its quality, texture and color characteristics have an important impact on the expression of paper-cut art and skills. For example, the ancient Chinese art of paper-cutting relied on traditional rice paper, which was favored by paper-cutting artists for its delicate texture and flexibility. The production process of rice paper includes specific types of wood pulp treatment and hand-made paper technology, whose characteristics make the art of paper cutting fine and complex. The invention and popularization of papermaking made paper widely available in China and other cultures, providing the basis for the development of the art of paper-cutting. With the popularity of paper, paper-cutting as an art form developed rapidly in China and gradually spread to other parts of the world. With the advancement of papermaking technology, the types and quality of paper are also

constantly improving, which provides more choices and possibilities for paper-cutting artists. Different textures and thicknesses of paper are suitable for different styles of paper-cut works. For example, modern mechanical papermaking technology can produce paper in a variety of colors and textures, providing more options for paper-cutting artists to create works in different styles. In modern times, the combination of paper-cutting art and papermaking technology is also reflected in decorative arts, fashion design, advertising and visual arts. Modern paper technology can produce paper suitable for a variety of innovative applications, thus expanding the scope of application of paper cutting art. In general, papermaking provides the necessary material basis for paper-cutting art, and with the development of papermaking technology and common progress, the two complement each other in the cultural and artistic inheritance and development.

4.1.2 Steps of papermaking

Raw material preparation

Cellulose is the main raw material for paper making. Sugar cane leaves contain a high proportion of cellulose, which makes them an ideal raw material for paper making. Cellulose provides the strength and stability required for paper, and this method utilizes the by-products of sugarcane farming, not only reduces agricultural waste, but also provides an environmentally friendly way to produce paper. In traditional sugarcane agriculture, sugarcane leaves are often treated as waste and may be burned or discarded, leading to waste of resources and environmental pollution. By using these leaves for paper making, the efficient use of agricultural by-products is achieved, the waste generation is reduced, and the recycling rate of resources is improved.

Under the guidance of the supervisor, the researchers went to the sugarcane yard of the farmer who had made an appointment in advance to collect materials. We chose the sugarcane yard that was about to mature, shuttled through the yard and harvested sugarcane leaves with sickles. In order not to affect the harvest of sugarcane and to obtain sufficient raw materials of sugarcane leaves, we needed to harvest 2-4 mature leaves from each sugarcane. Try to choose whole leaves without defects. After a morning's work, the researchers collected enough sugarcane leaves to make paper.



Figure 56 Collecting sugarcane leaves
source: Vuthipong Roadkasamsri 2023

Smash

The collected cane leaves are crushed or cut into small segments, which increase the surface area of the cane leaves and allow chemicals and heat to penetrate more easily into the fibers during subsequent chemical processing and cooking. This helps to break down cellulose more efficiently and remove unnecessary components such as lignin. At the same time, cutting into small segments can speed up the softening and decomposition process of the fiber, thereby improving the efficiency of the entire

papermaking process. In the process of cutting small segments and crushing, the researchers tried to use two methods to operate, method one, the use of a small hacksaw blade for manual cutting, this method of tool requirements are simple, only need a small hacksaw can be done, there is no too high technical threshold, everyone can meet the requirements. At the same time, its disadvantage is that the work efficiency is relatively low, and it consumes time and labor costs. Method two, the use of large mechanical shredders, this method of equipment requirements are relatively high, need to be equipped with a large grinder. The advantages are also obvious, the sugarcane leaves can be crushed efficiently, and the crushing is relatively fine, which is conducive to the operation of the subsequent process.



Figure 57 Tutor picks leaves

source: Cui BaoLi 2023



Figure 58 Tutor picks leaves

source: Vuthipong Roadkasamsri 2023



Figure 59 Tutor picks leaves
source: Vuthipong Roadkasamsri 2023

The crushed cane leaves are washed to remove dirt and other impurities mixed in and soften the fibers. Due to the need for chemical reagents to improve efficiency in the subsequent operation, this step is mainly cleaning, soaking time does not need too long, soaking for 30 minutes, so that it can fully absorb water.



Figure 60 Wash soak
source: Cui BaoLi 2023
cook

In the papermaking process, the fiber extraction step is crucial, the soaked sugarcane leaf fragments by steaming to extract its fiber, the main purpose of cooking is to soften the fiber in the plant raw materials. Hot water and steam can penetrate into the fiber cells, making the fibers soft and easier to handle and break down. Lignin is a substance in plant cell walls that provides rigidity and water resistance to plants. In paper making, lignin needs to be removed to extract pure cellulose. The cooking process helps break down the chemical bonds between lignin and cellulose, allowing the cellulose fibers to separate out. The cooking process, in addition to the decomposition of lignin, can also remove other impurities, such as oils, resins and pigments. This helps to ensure consistency in the colour and quality of the final paper produced. In order to improve the efficiency of cooking, while saving the use of energy. During the cooking process, the researchers added a chemical agent, strong alkali, and chemical agents such as sodium hydroxide (alkali) were added to the cooking process to remove the lignin. This treatment not only helps to separate the cellulose fibers, but also improves the bleaching effect of the fibers and the subsequent paper strength. (Biermann,C.J.(1996).

Handbook of Pulping and Papermaking. San Diego: Academic Press.) the researchers in a 1-0. 25 the proportion of adding sodium hydroxide. Boil with high

heat, turn to low heat to cook slowly, stir the raw materials at intervals during the cooking process to ensure that the raw materials are evenly heated. At the same time, observe the changes in the cooking process of raw materials. As shown in the figure, it can be seen that the color of raw materials in the cooking process gradually becomes darker from the beginning of grass yellow to the final ripe brown. It was cooked non-stop for two hours.



Figure 61 Add caustic soda and start heating
source: Cui BaoLi 2023

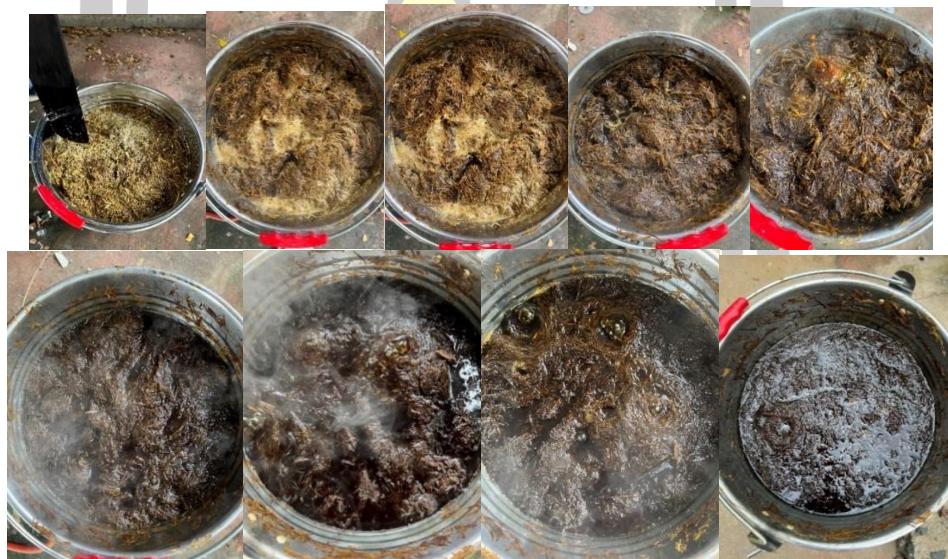


Figure 62 How the leaves change during heating
source: Cui BaoLi 2023

ພណ្ឌនំ បណ្តុះពិន្ទុ ខេវ

Beating, fiber separation

The cooking process softens the cellulose fibers in the cane leaves, but the fibers still require further separation to form a high-quality pulp. The use of a high-pressure water gun can effectively separate these softened fibers into smaller units, helping to prepare a uniform and fine pulp. Hubbe and Bowden (2009) point out in their study that fiber treatment using high pressure water flow is an effective way to improve pulp quality. This method enables finer separation of the fibers, which improves the uniformity of the pulp and the quality of the final paper. (Hubbe bioarchaeology, & Bowden, c. (2009). "HandbookofPaperandBoard: Pulping." - VCH. Wiley) in Bajpai (2018), he mentioned a water cannon on the pulp preparation, the application of The benefits of this method in improving pulp fineness and paper properties are emphasized. This helps to produce a more uniform and higher strength paper. (Bajpai, p. (2018). "BiorefineryinthePulpandPaperIndustry." AcademicPress.) using water cannons and broken after cooking materials plays an important role in the papermaking process, especially in the aspect of improving the quality and improve the performance of paper pulp. This physical method is more environmentally friendly than chemical treatment and has a significant effect on the quality and performance of the final product. Using a high-pressure water gun, the researchers stirred the boiled ingredients and then filtered them through a filter, resulting in a finer pulp fiber.



Figure 63 Water gun
source: Cui BaoLi 2023



Figure 64 High pressure washing
source: Cui BaoLi 2023



Figure 65 High pressure washing
source: Cui BaoLi 2023



Figure 66 Rinse and filter to obtain pulp
source: Cui BaoLi 2023

paper pulping

Choose a large container to ensure that at least the size of the paper mesh can be accommodated, first inject water that can drown the mesh, and then gradually put the prepared pulp into the container, stirring well each time until the clear water in the container can clearly see the uniform fiber. Paper experiments can be carried out

through the net to verify the amount of pulp added to ensure that the required thickness of paper can be produced.



Figure 67 Put the pulp into a basin filled with water
source: Cui BaoLi 2023



ພ້ອນ ປນ ຄີໂຕ ຂ່າວ
Figure 68 Even stirring
source: Cui BaoLi 2023

papermaking

The papermaking process is a very key link in the papermaking process, which directly affects the quality and characteristics of paper. First of all, prepare the net, with a wooden frame, and fix the fine grid in the middle of the net, and the net must be taut when fixed to ensure the quality of the net. Clean the net to prevent other magazines from affecting the quality of the paper produced. Penetrate the net into the prepared paper slurry, remember not to cross the net. Let the mesh rest in the paper slurry for a few seconds so that more cellulose can gather in the mesh, and then lift the mesh vertically, parallel to the water. When the water penetrates almost, observe the color of the pulp in the copying net, because the copying net is blue, the pulp is yellow, when the pulp in the copying net and the blue net form green is the best, at this time the thickness of the paper is appropriate, if you do not achieve this effect, you can pour the pulp on the copying net into the water, and try the above operation repeatedly. Until the pulp on the mesh appears green, remove the mesh to prevent it from standing on the shelf. Repeat the above steps to place more mesh onto the shelf.



Figure 69 Filter for paper making
source: Cui BaoLi 2023



Figure 70 Filter for paper making
source: Cui BaoLi 2023

Air dry

In the papermaking process, the drying step is crucial, it not only involves the removal of water in the paper, but also affects the final quality, appearance and performance of the paper, the first tilted storage of the net to ensure that the water in the pulp can be quickly lost, and then the net needs to be shifted to the shelf to ensure that the net is placed horizontally, so that the final production of paper will be more smooth. When drying to prevent water drops on the net, this time the pulp is very fragile, a drop can damage a piece of paper. When drying, also pay attention to be placed in a dry and cool place to dry, remember not to rush to success, placed in the sun or high temperature environment, rapid dehydration will lead to paper deformation, there is no way to produce flat paper.



Figure 71 air
source: Cui BaoLi 2023

Organize, paper out

After 3 days of drying, the moisture of the pulp on the net has dried, and the sheets of paper have been formed, and the paper needs to be removed from the net. Due to the natural viscosity of the pulp, in the drying process has been linked to the mesh on the net, if you are not patient enough when taking paper, it is likely to damage the paper, so that the early pay will be a failure. Be careful and patient when fetching paper. First check whether the paper on the net has dried out and is complete. Then turn the net around, start from the back of the net, gently along the frame of the net with your fingers, when the net is separated from the paper, it will make a "blips"

sound, from all sides to the middle, until the whole paper is separated from the net, at this time, put the net over and slowly remove the paper, so that a complete paper is made.



Figure 72 Paper taking
source: Vuthipong Roadkasamsri 2023



Figure 73 Paper made from sugarcane leaves
source: Cui BaoLi 2023

Sugarcane leaves are considered a suitable raw material for paper making due to their high cellulose content and environmental sustainability advantages. These properties make it a promising alternative to traditional wood pulp while contributing to environmental protection and sustainable use of resources. By using sugarcane leaves as raw materials for papermaking, researchers have mastered the steps and skills of papermaking, and laid the knowledge foundation of papermaking for the following research.

ພ້ອນ ປະ ຄິໂຕ ຂ່າວ

4.2 Looking for materials suitable for papermaking in Zhangpu County

4.2.1 Find materials

Material requirement

When selecting plant raw materials for paper making, a number of factors need to be considered to ensure that the material chosen can meet the production needs of a specific type of paper. First consider the cellulose content and quality, the cellulose content of plant raw materials is the main factor determining its applicability. A high cellulose content usually means better paper quality. Wood fibers, such as spruce and pine, are widely used in paper making because of the high quality of their fibers. The fiber length has a direct effect on the strength of the paper. Long fibers are often used to make high-strength papers, such as writing and drawing paper, while short fibers are suitable for making more absorbent papers, such as toilet paper. The second is environmental sustainability. When selecting raw materials, consider their impact on the environment. Sustainably managed forests and non-wood fibers (such as bamboo and straw) are environmentally friendly options. With the increasing awareness of environmental protection, the use of these sustainable resources is getting more and more attention. The final consideration is cost effectiveness and local availability, and the economics of raw materials is also an important consideration. Lower-cost raw materials, such as recycled paper or agricultural waste, can reduce production costs, especially when making lower-cost paper. The geographical availability of raw materials also influences their selection. Locally available raw materials can reduce transportation costs and environmental impact while supporting local economies. The selection of plant raw materials for papermaking is a process that takes many factors into consideration. High cellulose content, appropriate fiber length, environmental sustainability, cost-effectiveness and local availability are all key factors in determining the suitability of raw materials. With the increase of environmental awareness and the development of technology, the process of selecting paper raw materials is also constantly evolving to adapt to the changing market and environmental needs.

Common plants in Zhangpu

Zhangpu County is located in Fujian Province, belongs to the south subtropical Marine monsoon climate. This climate is characterized by a warm and humid climate, suitable for the growth of a variety of plants. Due to its superior geographical location and fertile soil, Zhangpu County has favorable climatic conditions for agriculture and plant growth. The main common plants include the following:

Andrographis andrographis

Quality characteristics: fresh leaf hypertrophic hay dark green medicinal



Figure 74 Andrographis
source: Baidu Encyclopedia 2010

Cinnamomum rubra is red back osmanthus, it is a euphorbiaceae evergreen small shrub, because of its leaf back for red name. It is a kind of foliage and flowering plant with high practical value



Figure 75 Cinnamomum rubra
source: Hong ShiYin 2023

Mulberry, the fruit of deciduous tree plant of the mulberry family, mulberry trunk is high, the tree body is rich in whey, the bark is rough, yellow brown; The leaves are large, oval in shape, with coarsely serrated edges, glabrous on the surface, and sparsely hairy on the dorsal veins of the leaves.



Figure 76 Mulberry
source: Hong ShiYin 2023

Anemone solanum It likes warm, moist, semi-shade and well-ventilated environment, is afraid of cold, and has weak cold resistance. The stem is smooth, yellow-green, without burrs, and is coated with wax powder when young, with obvious leaf marks and a ring pattern



Figure 77 Anemone solanum
source: Hong ShiYin 2023

Palm bamboo, also known as Guanyin bamboo, sinehead bamboo, palm bamboo, dwarf palm bamboo, is an evergreen foliage plant, palm bamboo originated in China, Japan is also planted. Brown bamboo like warm and humid, half shade and good ventilation environment, fear the sun in the sky, more cold. The berries and seeds are spherical.

ພួនំ បណ្តិត ខេវ



Figure 78bamboo
source: Hong ShiYin 2023

Banyan It is a plant of the mulberry family and Ficus. Large trees, up to 15-25 m tall, with a diameter of 50 cm at breast and a wide crown; Old trees often have rusty brown gas roots. The bark is dark gray. Leaves thinly leathery, narrowly oval, surface dark green, glossy, whole margin.



Figure 79 Banyan
source: Hong ShiYin 2023

It is a genus of pinaceae. This genus is evergreen trees, rare shrubs; The branches are whorled, the bud scales are numerous, and the arrangement is imbricate.

ພណ្ឌ បណ្ឌិត ខេវ



Figure 80 Pine tree

source: Hong ShiYin 2023

Taiwan forsythia, small bitter forest plate, Ruyi grass, false forsythia.



Figure 81 False forsythia

source: Hong ShiYin 2023

porphyra tenera, a member of the porphyra genus in the Rhodochaetaceae family, is quite effective in preventing cancer. [10] Promorphophyllum is a flat thallus with a short stalk. The thallus growing from the stalk is broadly lanceolate or oval, membranous, thin and translucent, with undulating edges. It is light pink when young and dark purple later.



Figure 82 *porphyra tenera*
source: Hong ShiYin 2023

Saccharina japonica It is a large perennial edible algae. It's very effective in preventing cancer. The sporophyte is large, brown, and flat. It is divided into leaves, stalks and fixers, and the fixers are rhizomorphic. The leaf is composed of epidermis, cortex and pulp tissue, and sporangium is found in the lower part of the leaf. It has a mucous cavity and can secrete slippery substances. A tree-like branch for attaching seafloor rocks and growing in cooler waters.



Figure 83 *Saccharina japonica*
source: Hong ShiYin 2023

4.2.2 Materials that meet the requirements

Andrographis paniculata is an herb that is widely cultivated mainly in Asia, especially in India and China. It is mainly known for its medicinal value, especially its application in traditional herbal medicine. andrographolide contains a variety of bioactive ingredients, such as Andrographolide, and is often used to treat symptoms such as colds, fever, and indigestion.

As for papermaking, the traditional papermaking raw materials are usually wood pulp, cotton pulp or other fiber-rich plant materials. Although many types of plant fibers can theoretically be used for papermaking, *Andrographis paniculata* may not be suitable for making high-quality paper due to its fiber content and structure. *Andrographis paniculata* may have insufficient fiber content or fiber quality suitable for paper making (Smith&Zhang,2019). Therefore, it is not usually used as a raw

material for paper making. The paper making process requires longer, stronger fibers to form durable paper, and the plant structure of *Andrographis paniculata* may not meet these requirements. Therefore, *Andrographis paniculata* is not used as raw material for papermaking in this study.

Erythrophleumfordii (*Erythrophleumfordii*) is a woody plant mainly distributed in Southeast Asia, especially in southern China. There is not much information about the use of red back laurel in paper making. Wood fiber is one of the common raw materials in paper industry. Given that the red back is a woody plant, its wood theoretically contains cellulose that can be used to make paper. Wood fibers have the right length and strength for making paper (Smith&Zhang,2019). When using any woody plant as a raw material for papermaking, its environmental impact needs to be considered, especially given that the red back laurel may not be a commercial tree grown on a large scale. Sustainability and environmental impact are important factors when choosing raw materials for paper making (Patel&Kim,2018). It may be used in different industrial applications, such as furniture making or building materials, because of its other properties, such as hardwood material. Papermaking may not be the primary or most efficient use for this plant (Chen&Wang,2021). To sum up, although the red back laurel as a woody plant can be used for papermaking theoretically, whether it is practical application, by considering its fiber characteristics, environmental impact, technical treatment and economic cost and other comprehensive issues, this study temporarily does not use it as a raw material for papermaking.

Morusalba, the fruit of the mulberry tree, is not usually used directly for paper. However, the bark of the mulberry tree (especially the bark of the tussah tree) is an important raw material in the traditional East Asian art of papermaking, especially in the production of high-quality handmade paper such as Japanese Washi and Korean Hanji. The bark of the mulberry tree is rich in long cellulose fibers, which are especially suitable for making high-quality paper. The strength and durability of mulberry fiber make it ideal for making durable and aesthetically pleasing paper (Kim&Lee,2021). The use of mulberry bark may have a lower environmental impact than traditional wood pulp, as it can be used as a more sustainable pulp resource, especially in well-managed agricultural environments (Smith&Zhang,2019). To sum up, mulberry is a raw material that can be used as a papermaking material.

Scatter-tailed mallow (*Typhaspp.*), commonly known as cattails, is a common wetland plant known for its long, thin leaves and distinctive flower spikes. Its applications lie mainly in ecological engineering and horticulture, but relatively little information is available in papermaking. The leaves and stems of the sunflower contain cellulose, one of the main raw materials for paper making. Although the cellulose content may be low, with proper treatment, it may be useful for making specific types of paper (Smith&Zhang,2019). As a fast-growing wetland plant, spiltail mallow may be an environmentally friendly and sustainable raw material for paper making. Its use may help reduce dependence on forest resources (Patel&Kim,2018). To sum up, in this study, the sunflower was used as a raw material for paper making.

Bambusavulgaris (*Bambusavulgaris*) is a common species of bamboo widely distributed in tropical and subtropical regions of Asia. As a fast-growing herb with a high cellulose content, bamboo has proven to be an effective and sustainable

feedstock for the paper industry. Palm bamboo is rich in cellulose, and its fiber has good strength and length, which is suitable for papermaking. These properties of bamboo fiber make it an excellent pulp source (Zhang&Li,2020). Bamboo has a fast growth rate and strong renewal capacity, so it has a high environmental sustainability as a pulp raw material. The use of palm bamboo can help reduce dependence on forest resources and has a positive impact on the ecological environment (Kim&Park,2019). As a fast renewable resource, the utilization of palm bamboo can improve the economic efficiency of the pulp industry, especially in areas rich in bamboo resources (Patel&Kim,2018). To sum up, palm bamboo is regarded as a valuable raw material in the paper industry because of its excellent fiber characteristics, environmental friendliness and economic benefits. At the same time, it can also be used as a raw material for paper making in this study.

Ficus banyan (*Ficus SPP.*), as a large tropical and subtropical plant, is often known for its unique growth pattern and ecological value. There is relatively little information about the use of *ficus* for paper, mainly because it is not generally a major source of raw material for the paper industry. However, starting from the general principles of paper making, we can explore the potential of *ficus* for paper making and its possible challenges. The banyan tree is a woody plant, and its woody part theoretically contains cellulose, which can be used to make paper. However, the length, strength, and quality of these fibers may differ from those of traditional papermaking woods such as pine and eucalyptus (Smith&Zhang,2019). *Ficus* trees play an important role in many tropical and subtropical ecosystems, especially as habitat for many wildlife species. Therefore, the use of banyan trees for commercial papermaking may require consideration of their potential impact on the ecosystem (Patel&Kim,2018). Considering that the banyan tree may not be a widely cultivated commercial tree, its sustainability as a papermaking feedstock and resource management is also a factor to consider (Chen&Wang,2021). In summary, although *ficus* contains cellulose that can be used in paper making, its practical application as a papermaking feedstock may depend on fiber characteristics, environmental impact, technical treatment, and economic viability. Therefore, it is not used as a raw material for paper making in this study.

Pine (belonging to the genus *Pinus*) is one of the most widely used woods in the paper industry. Pine wood is widely used in the production of various types of paper due to its excellent fiber properties. Pine wood contains long fibers, which are particularly suitable for paper making and can provide good strength and toughness of paper. Long fiber pulp is commonly used to produce high quality printing paper and wrapping paper (Smith&Zhang,2019). As a fast-growing tree, pine has a relatively high sustainability as a pulp raw material. Under sustainable forestry management, the use of pine trees can reduce environmental impact (Kim&Park,2019). Due to the widespread cultivation and high yield of pine, it is economically an effective raw material for papermaking. The production cost of pine pulp is relatively low, which is conducive to the economic benefits of the paper industry (Patel&Kim,2018). To sum up, pine occupies an important position in the paper industry due to its excellent fiber properties, environmental sustainability and economic benefits. Therefore, pine trees are used as raw materials for paper making in this study.

False forsythia (*forsythias suspensa*), as a deciduous shrub, is widely cultivated and appreciated mainly for its bright yellow flowers in early spring. There is relatively

little information about the use of forsythia in paper making, as it is generally not a traditional raw material in the paper industry. As a shrub, the woody portion of false forsythia may contain a certain amount of cellulose, but its fiber length, strength, and quality may differ from the traditional wood fiber needed for paper making. Whether the fiber of false forsythia is suitable for paper making needs more research (Smith&Zhang,2019). While false forsythias are often grown for their ornamental and medicinal value, their potential value as a raw material for paper making may not be as valuable in horticulture and traditional medicine (Chen&Wang,2021). The use of false forsythia for paper may require specific technical treatment, such as the extraction and improvement of fibers. In addition, the cost-effectiveness of using fake forsythia compared to traditional paper raw materials is also an important consideration (Lee&Park,2020). In summary, although forsythia may contain cellulose, its practical application as a papermaking raw material may be limited by fiber characteristics, environmental impact, technical treatment, and economic feasibility. In this study, it is not considered as a material that can be used for paper making.

*Porphyra*spp, a type of seaweed, is widely used as a food ingredient mainly in the food industry, especially in Asia. There is relatively little information about the use of laver in paper making, but from the general principle of seaweed fiber in paper making, we can explore the potential and possible challenges of laver in paper making. Nori and other seaweed contain algal cellulose, which is slightly different from that found in land plants but could theoretically be used for paper. The properties of seaweed fibers may require specific treatment to be suitable for papermaking processes (Zhang&Li,2020). The use of laver as a pulp feedstock may be environmentally friendly, especially given its role as a rapidly growing Marine resource. The use of laver can help reduce dependence on forest resources (Kim&Park,2019). Considering that laver is mainly used as a food raw material, its economic benefits as a papermaking raw material need to be further evaluated. In addition, paper made from laver may have special properties and application value (Patel&Kim,2018). In summary, laver is identified as a material that can be used for paper making in this study.

Kelp, as a brown algae, actually has some potential in the paper industry. Fibrous properties of kelp: Kelp is rich in cellulose and polysaccharides, which are very important in paper making. Cellulose is a key raw material for paper making, while other polysaccharides in kelp can increase the strength and toughness of paper (Kim&Park,2020). Environmentally friendly: Using kelp as a raw material for paper making can reduce reliance on forest resources and help reduce environmental damage. Kelp is a sustainable resource with a fast growth rate and no need to occupy arable land (Leeetal.,2018). Seaweed requires less energy and fewer chemicals to produce pulp than wood pulp. For example, to extract pulp from wood, it is necessary to boil it at a high temperature for several hours and add sodium hydroxide. In contrast, the process explored by the University of Malaya to obtain pulp from red seaweed involves cooking with water for two hours at a temperature of just 100°C. Adaptability of papermaking process: Studies have shown that kelp fiber can be treated with certain chemicals, such as alkalization, bleaching, etc., to make it more suitable for papermaking process. These treatments can improve the quality of the fiber and make it suitable for paper making (Choi&Han,2019). Manufacture of special

paper: Paper made from kelp fiber may have special properties, such as antibacterial properties or unique texture, which makes it a potential market advantage in the manufacture of special purpose paper (Wang&Liu,2021). Cost and efficiency issues: Although kelp has potential paper value, it still faces some challenges in commercial production, including the cost and efficiency of raw material collection, as well as technical issues in the production process (Zhangetal.,2022). To sum up, kelp has potential application value in the field of paper making due to its cellulose content and environmental friendliness. However, its application in commercial papermaking still needs further research and technology development.

4.2.3selected material

Collect data

A questionnaire on the knowledge of paper making materials in Zhangpu area has been designed. See Annex 1 for details of the questionnaire. A questionnaire was conducted among 100 local residents in Zhangpu County, Fujian Province. The process of conducting a survey and collecting data needs to be properly organized to ensure that the data collected is accurate and reliable. The data collection process is divided into preparation stage and implementation survey stage.

The preparation stage includes: Firstly, prepare the questionnaire, which adopts online and offline methods. Considering that young people are accustomed to using smart phone devices, the survey can be conducted by electronic questionnaire to shorten the survey process and improve the efficiency of the survey. Older respondents may not be good at using smart devices, so they also printed questionnaires for offline use. The second is to determine the investigators. This questionnaire is mainly conducted by the researchers of this paper. The researchers design the designated questionnaire and understand the contents and purpose of the questionnaire. Finally, the survey plan was formulated, and the survey was divided into online and offline. The online survey mainly targeted at young residents in Zhangpu through wechat platform, and about 50 people were sampled. Offline to print questionnaires, mainly in Zhangpu County, about 50 people. The target interviewees are mainly between 20 and 60 years old.

During the survey phase, in order to ensure the authenticity of data, random sampling should be carried out in the selected areas when selecting respondents. Ensure randomness. When distributing the questionnaire to respondents, provide the necessary guidance and explanation to ensure that respondents understand each question and complete the questionnaire completely. After respondents complete the questionnaire, it is necessary to collect the questionnaire in time to prepare for subsequent data analysis.

Collate and analyze data

Data entry

Enter the questionnaire data into a spreadsheet and assign each participant a unique ID. For each question, enter the corresponding answer. For example, for the degree of understanding and representation of papermaking materials, the corresponding scores are entered respectively. As shown in the figure. Data cleaning. Check data consistency and accuracy. For example, make sure all scores are on a scale of 1 to 5. Eliminate invalid or incomplete questionnaires. For example, if there are questionnaires that do not answer all questions, they may need to be excluded from the analysis.

Data analysis

Average the knowledge and representativeness of each papermaking material. And the data results are produced to generate a histogram for easy viewing and comparison, as shown in the figure.

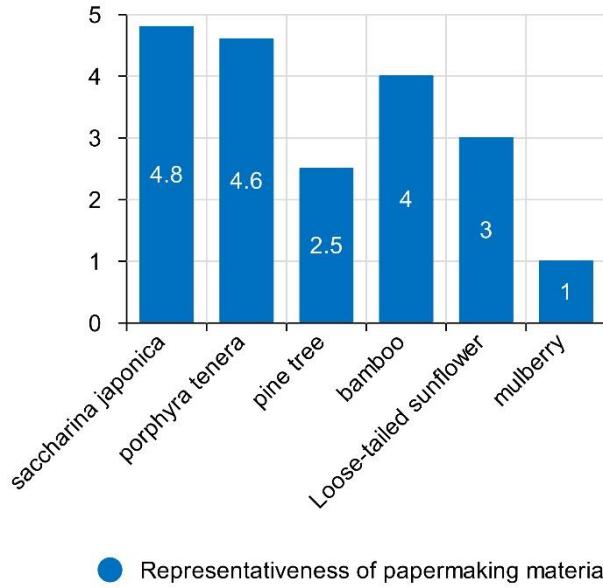


Figure 84 Paper materials representative data histogram

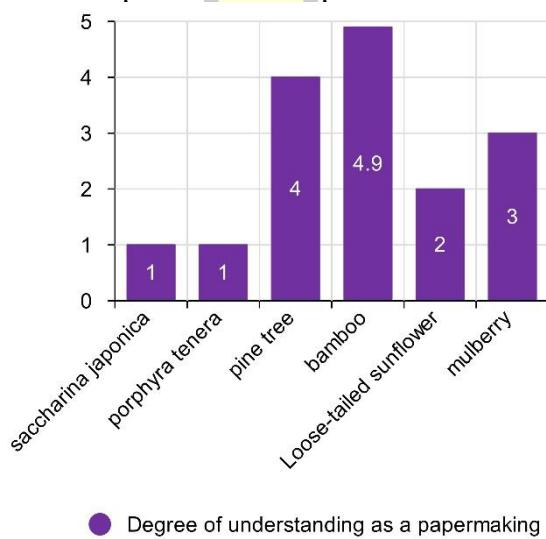


Figure 85 Paper material knowledge level data histogram

According to the data analysis, we can see the representative score of different papermaking materials in Zhangpu area. Kelp ranked first with an average score of 4.8, indicating that it has a high representation as a papermaking material in Zhangpu area. Nori followed closely with an average score of 4.6, also showing high representation. In contrast, the average score of pine is only 2.5, indicating that it is less representative as a papermaking material in Zhangpu region. The scores of bambusa palustris and Mallow palustris were 4 and 3 respectively, indicating that their representation in Zhangpu area was between medium and high. The average score of mulberry is the lowest, 1 point, indicating that it is very low in local representation as a papermaking material. These data will be used to guide the

selection and research direction of papermaking materials in Zhangpu area. In particular, kelp and laver, as representative materials, will be the focus of further research and development.

4.3 Papermaking experiments

4.3.1 *Saccharina japonica* (Brown seaweed)

General characteristics

Saccharina japonica is a Marine species named *Saccharina japonica* (pre-2006 *Laminaria japonica*, post-2006 *Saccharina japonica* (J. E. Areschoug 1851). It is an edible algal, multicellular eukaryotic organism of the genus *Laminaria*.

Classification:

Biota >Chromista (Kingdom) >Harosa (Subkingdom)
 >Heterokonta (Infrakingdom) >Ochrophyta (Phylum) >Phaeophyceae (Class)
 >Fucophycidae (Subclass) >Laminariales (Order) >Laminariaceae (Family)
 >*Saccharina* (Genus) >*Saccharina japonica* (Species).

Scientific name: : *Saccharina japonica*

English name : Brown seaweed

Local name: Hai Dai



Figure 86 *Saccharina japonica*
 source: Cui BaoLi 2023

Status: accepted

Rank: Species

Parent: *Saccharina* Stackhouse,1809

Orig.name: *Laminaria japonica* Areschoug,1851

Environment: marine

Taxonomic citation: Guiry, M.D. & Guiry, G.M. (2023). AlgaeBase. World-wide electronic publication, National University of Ireland, Galway (taxonomic information republished from AlgaeBase with permission of M.D. Guiry). *Saccharina japonica* (Areschoug) C.E.Lane, C.Mayes, Druehl & G.W.Saunders, 2006. Accessed through: World Register of Marine Species at:

<https://www.marinespecies.org/aphia.php?p=taxdetails&id=377084> on 2023-12-15

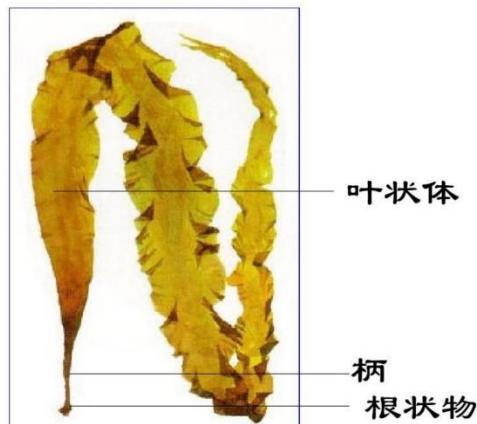


Figure 87 *Saccharina japonica* structure

This illustration shows the structure of *Laminaria japonica*, including its different parts: the holdfast, the stipe, and the frond. Together, these parts form the overall structure of kelp, each with its own unique functions and properties: the Holdfast: It is the part of kelp that is fixed to a rock or other hard bottom surface. The rhizoid itself does not absorb nutrients, but it firmly holds the kelp in place, allowing it to grow steadily in ocean currents. Stipe: The stipe is the part that connects the rhizoid to the thallus. It is usually longer and able to support the thallus, giving it access to more light and nutrients in the stream. The elasticity and toughness of the stalk enable the kelp to adapt to strong currents and tidal changes. Thallus (Frond) : This is the most prominent part of kelp and is usually long in shape. Thallosomes play a key role in photosynthesis in kelp, containing chlorophyll and being able to absorb sunlight and nutrients to provide the energy the kelp needs.

Kelp is native to Northeast Asia, including the Pacific coast of Russia, Japan, and the northern coast of Korea. Later, it was cultivated and grown in the sea along the coast of Liaodong Peninsula and Shandong Province of China. Today China is the world's largest producer of kelp. The leaves are banded, up to 1 m long and 10-20 cm wide, with wavy overlapping edges, thick middle and thin edges. The base of the blade has a short, small shank and a retainer. A strong fixator (hemiptera) by which algae are fastened to a rock matrix. Color: dark green; Leaf surface brown, occasionally glaucous.(Thallus consisting of root-like holdfast, short stipe and blade. Blade long-belt shaped, up to one meter long, 10-20 cm broad, with margin undulate and overlapping, thick at the middle and thin at the margin. A short and small stipe and holdfast at the base of the blade. Holdfast sturdy (presenting haptera) with which the algae is fixed to rocky substratum. Colour: thick dark green; blade surface brown, occasionally glaucescent.) The growing period in the natural environment is two years, and the breeding period in the planting environment is two years.

China is the largest producer of *Laminaria*, contributing over 4.0 billion kg wet weight. *L. japonica* grows well on reefs or stones in the subtidal zone, at a depth of 2–15 m (sometimes up to 30 m). They prefer sheltered and calm seas, rather than open waters. The thalli of the edible kelp *L. japonica* are large, up to 2–5 m in length, but sometimes may grow up to 10 m. The life cycle of *Laminaria* is well understood. It consists of an alternation of generations between a microscopic gametophytic phase and a very large macroscopic sporophytic phase. In the field, the frond (the

sporophytic phase) usually matures during spring and late autumn. The sporophyte releases the zoospores that settle down on a substratum. They immediately germinate and grow into microscopic male and female gametophytes in equal ratios. Upon reaching maturity, the filamentous male gametophyte releases motile biflagellate sperm (from an antheridium) that fertilize a large nonmotile egg that is extruded from the oogonium. Within 15–20 days, young sporophytes develop, thus completing the life cycle. In nature, *L. japonica* is a biennial, and the frond reaches a harvestable size in about 20 months after germination. The cultivation period can be reduced to as little as 8–10 months through a technique called 'forced cultivation'. As with *Undaria* (another species of kelp), the cultivation of *Laminaria* consists of four phases: (1) collection and settlement of zoospores on seed strings; (2) production of seedlings; (3) transplantations and outgrowing of seedlings; and (4) harvesting. (R. Pereira, C. Yarish, 2008)

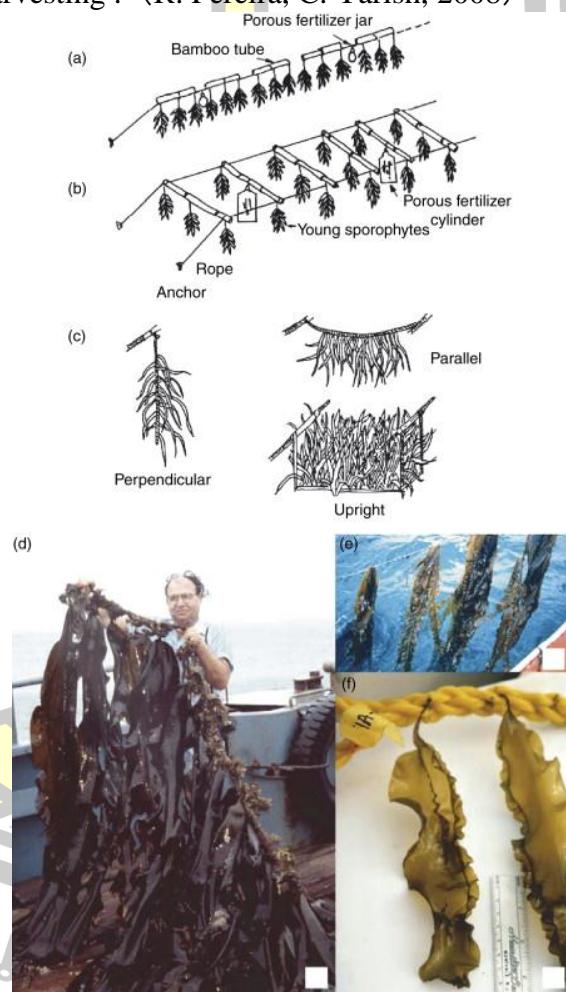


Figure 88 *Saccharina japonica* structure
source: R. Pereira, C. Yarish, in Encyclopedia of Ecology, 2008

Papermaking experiment

In order to ensure the diversity of experimental results, three groups of laminaria papermaking experiments were designed.。

experiment 1 : Leaf Sheet (S1)

- 1、Collect kelp leaves.
- 2、Cut the kelp leaves directly with a knife and splice them into the desired shape.
- 3、To press it, to shape it.
- 4、Dry to make paper.
- 5、The experimental data and observations were recorded.

experiment 2 : Crushed Leaves (S2)

- 1、Collect kelp leaves.
- 2、Cut into pieces
- 3、The pieces were fermented and the fermentation time was recorded.
- 4、The fermented shredded kelp slices are made into pulp.
- 5、Carry out the papermaking process.
- 6、Dry to make paper.
- 7、The experimental data and observations were recorded.

experiment 3 : Boil the Pulp (S3)

- 1、Collect kelp leaves.
- 2、Blade grinding.
- 3、Boil the crushed leaves without adding any chemical reagents for two hours.
- 4、Rinse well and crush with a high-pressure water gun.
- 5、The kelp was filtered and the extract was used as pulp.
- 6、Carry out the papermaking process.
- 7、Dry to make paper.
- 8、The experimental data and observations were recorded.

The results of each experiment can be numbered with S1, S2 and S3 to facilitate data statistics and comparison. When recording data, indicators such as the texture, strength, and color of the paper can be included, and comparative analysis can be performed to determine which preparation method is the best.



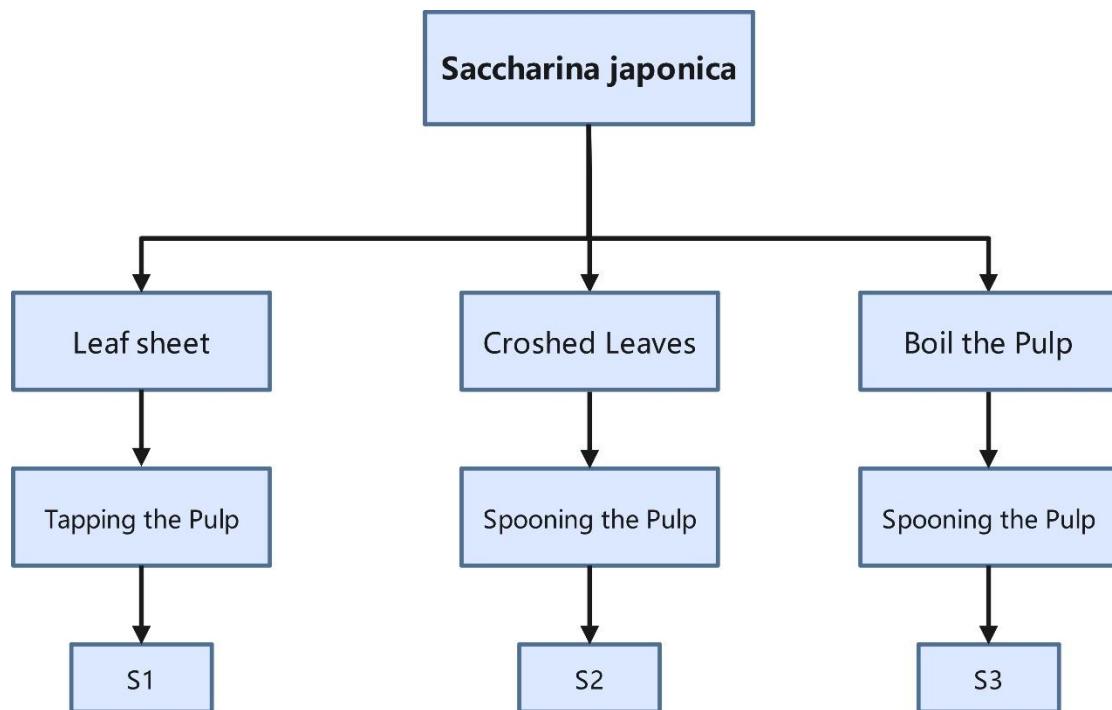


Figure 89 Saccharina japonica paper experiment design drawing
Experiment 1:Leaf Sheet (S1) - Laminaria leaf paper was prepared

Step 1: Collect kelp leaves

Select dried kelp leaves, wash and soak, soak for 60 minutes. Kelp inhaled water into fresh kelp leaves, choose relatively intact kelp without damage.



Figure 90 Saccharina japonica
source: Cu i BaoLi 2023

Step 2: Cut and splice the blades

Use a sharp knife to cut the collected and selected kelp blades into the desired shape and size. This can be adjusted according to the needs of the experiment. Make sure the blades are cut neatly. Then the cut blade is neatly and closely arranged on the screen.



Figure 91 Cut and splice the blades
source: Cui BaoLi 2023

Step 3: Press

The cut kelp blade is spliced into the desired shape and pressed with the appropriate tool. Pressing helps to glue the blades together to form a strong sheet of paper.



Figure 92 Press
source: Cui BaoLi 2023

Step 4: Let dry

Place the pressed kelp leaf paper in a well-ventilated place to dry. It can be dried indoors or outdoors, depending on environmental conditions and paper quality requirements, but do not place it directly in the sun, which can easily lead to the deformation of the paper. The researchers placed it indoors and dried it naturally. A 4-day drying period was performed, and the length of drying time may vary depending on the ambient humidity.



Figure 93 Drying process
source: Cui BaoLi 2023

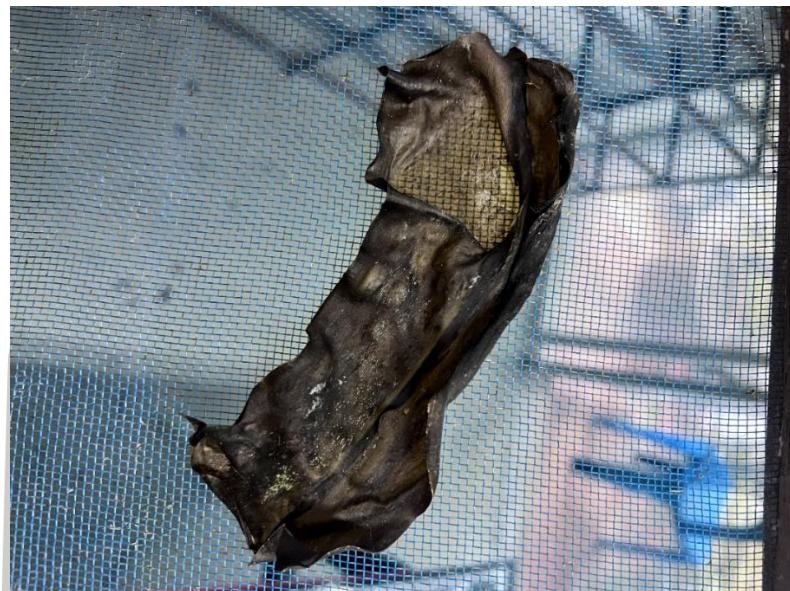


Figure 94 Finished product

source: Cui BaoLi 2023

Step 5: Record the experimental data and observations

Record the material, time and temperature parameters used in the preparation of paper. Also record the paper's texture, thickness, color, and any other relevant observations. These data will be used for subsequent analysis and comparison.

Experiment 2: Crushed Leaves (S2) - Preparation of crushed leaves

Step 1: Collect kelp leaves

Select dried kelp leaves, wash and soak, soak for 60 minutes. Kelp inhaled water into fresh kelp leaves, choose relatively intact kelp without damage.



Figure 95 *Saccharina japonica*

source: Cui BaoLi 2023

Step 2: Cut the blades

Use a sharp knife to cut the collected kelp blades into smaller pieces. These pieces will be used to make pulp.



Figure 96 Cut the blades
source: Cui BaoLi 2023

Step 3: Ferment the kelp leaves

Put the cut kelp leaves into a container and ferment. The fermentation time can be adjusted according to the needs of the experiment, usually several hours to several days. Fermentation helps break down the cellulose in the leaves, making it easier to convert into pulp.



Figure 97 cleanse
source: Cui BaoLi 2023



Figure 98 Waterflood fermentation
source: Cui BaoLi 2023



Figure 99 Samples after fermentation



Figure 100 Prepare the birdbath and strainer

source: Cui BaoLi 2023

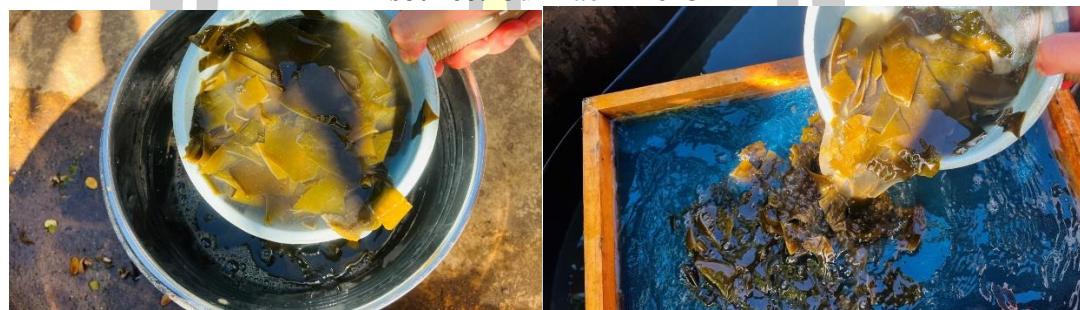


Figure 101 Cleaning and filtration

source: Cui BaoLi 2023



Figure 102 equalize

source: Cui BaoLi 2023



Figure 103 Let water out

source: Cui BaoLi 2023



Figure 104 Air dry
source: Cui BaoLi 2023

Step 4: Prepare the pulp

After fermentation is complete, put the fermented crushed kelp pieces into a blender or mixing bucket, add the right amount of water, and then stir to obtain an even pulp. You can adjust the amount of water as needed to get the desired concentration.

Step 5: Paper making process

The prepared pulp is poured into the mold or equipment used to make the paper. Paper can be formed using filter paper, fabric, or other suitable materials. Make sure the pulp is evenly distributed in the mold.

Step 6: Dry to make paper

Place the paper mold in a well-ventilated place to dry. Drying time may vary depending on ambient humidity. You can use mild hot air or air dry.

Step 7: Record the experimental data and observations

Record the materials used in the preparation of paper, fermentation time, pulp concentration, drying time and other parameters. Also record the paper's texture, thickness, color, and any other relevant observations.

You will get paper made from fermented kelp leaves (CrushedLeaves). This preparation method differs from the methods used in Experiments 1 and 3 because it includes the additional step of fermentation. You can compare and analyze it with papers from other experimental groups (S1 and S3) to determine which preparation method works best.

Experiment 3 : Boil the Pulp (S3)

Step 1: Collect kelp leaves

Select dried kelp leaves, wash and soak, soak for 60 minutes. Kelp inhaled water into fresh kelp leaves, choose relatively intact kelp without damage.



Figure 105 Saccharina japonica
source: Cui BaoLi 2023

Step 2: Blade grinding

Using suitable tools, the collected kelp leaves were crushed into smaller pieces. In this study, the researchers used a kitchen knife to cut the pre-soaked and softened kelp leaves into small pieces. This step is crucial because it helps make it easier to handle. The cutting parts are approximately 2 cm in size, length and width and have been carefully selected to optimize the surface area for subsequent processing. After cutting, these pieces of paper undergo a thorough rinsing process to remove any impurities or excess salt, which is essential to maintaining the quality of the final pulp. The clean pieces of kelp can then be used in the next stage of pulp preparation, where they are further processed to convert them into a form suitable for paper making.



Figure 106 Blade grinding
source: Cui BaoLi 2023

Step 3: Bring to the boil

Place the cut pieces of kelp leaves into a large pot with enough water, then boil using a natural gas burner. The high temperature will quickly raise the water temperature and start the boiling process. After boiling, reduce the heat to maintain a mild simmer. This slow cooking method, which lasts about two hours or as needed for the experiment, can completely break down the kelp tissue. In the whole process, no chemical reagents are added to ensure the natural treatment of kelp. The researchers must carefully monitor the transformation of the kelp during cooking and carefully record the time, which is usually set to 120 minutes. Emphasize safety precautions, especially to avoid burns from boiling kelp and water. The goal is to maintain the integrity of the experiment while ensuring the safety of the researchers involved. This detailed procedure emphasizes the importance of precision and safety in the experimental handling of kelp in pulp production.



Figure 107 Heated stove



Figure 108 Heat to a boil, then reduce to a simmer

source: Cui BaoLi 2023



Figure 109 Record the cooking process

source: Cui BaoLi 2023

Step 4: Rinse

After completing the boiling process, the kelp pieces are thoroughly rinsed to remove any remaining impurities and contaminants. This step is done by placing the cooked kelp pieces into a large basin and washing them repeatedly with clean water. Each rinse involves stirring the kelp in the water to loosen and wash away any remaining debris, ensuring that the kelp is completely clean. This meticulous washing not only improves the quality of the final product, but also prepares the kelp for subsequent processing steps. The rinsing process is essential to ensure that kelp pulp, once processed, is of the highest purity and suitable for its intended use.



Figure 110 cleanse

source: Cui BaoLi 2023

Step 5: Crush

The cleaned pieces of kelp need to be further pulverized using a high-pressure water jet or similar effective tool to obtain a finer pulp, which is a key step in evenly dispersing the fibers. In this study, the process used a high-pressure water jet with a pressure of 1000pa. Crush the kelp into water and strain it. This crushing and filtering process is repeated until the kelp is almost completely crushed, ensuring a consistent

and fine pulp suitable for high-quality paper production. This methodical approach increases the efficiency of fiber separation and helps to improve the overall quality of the final paper product.



Figure 111 High pressure cleaning
source: Cui BaoLi 2023



Figure 112 The mixture is crushed under high pressure
source: Cui BaoLi 2023

Step 6: Filter

After the kelp is crushed, the resulting material is passed through a fine filter or screen to separate the pulp, which is a key step in the production of high-quality paper. Given the fine nature of crushed kelp, very fine mesh was used for filtration in this study to ensure that only the finest flesh was extracted. This process not only maximizes the amount of available pulp, but also improves the uniformity and quality of the paper to be produced. The careful selection of filter media reflects the meticulous approach required to convert kelp into a viable papermaking material.



Figure 113 Pulp is made by filtering

Step 7: Paper making process

Choose a large container that can be used to hold the mesh work. The container was first filled with a large amount of water to ensure that the mesh was submerged, and then the prepared pulp was poured into the container, which the researchers used a large birdbath. Then put the paper mesh into the water basin, and put the prepared pulp into the mold of the mesh. In this study, 500g of pulp is taken here. In order to ensure the uniform dispersion of the pulp, the pulp can be fully stirred until it is completely dispersed into the water to ensure that there is no aggregation of condensates. If it is found that there is an obvious uneven distribution in the copying net, the pulp can be gently adjusted by hand control. Finally, lift the net perpendicular to the ground, so that the water slowly detached.



Figure 114 P Record experimental data
source: Cui BaoLi 2023



Figure 115 Lost water
source: Cui BaoLi 2023

Step 8: Dry to make paper

Put the paper mesh mold in a well-ventilated place to dry. Drying time may vary depending on ambient humidity. You can use mild hot air or air dry until the paper is completely dry. But do not place directly in the sun exposure, it is easy to lead to the deformation of the paper. The researchers placed it indoors and dried it naturally. A 3-day drying period was performed, and the length of the drying time may vary depending on the ambient humidity.



Figure 116 Air dry



Figure 117 Air dry 2

source: Cui BaoLi 2023

Step 9: Record the experimental data and observations

Record the materials used in the preparation of paper, boiling time, filter type, drying time and other parameters. Also record the paper's texture, thickness, color, and any other relevant observations. Observe the paper, summarize and record the data, make a table.



Figure 118 Finished paper

source: Cui BaoLi 2023

After completing these steps, you will have kelp paper (BoilthePulp) made by traditional preparation methods. This method is different from those used in experiments 1 and 2 because it includes the additional steps of boiling and filtration. You can compare and analyze it with papers from other experimental groups (S1 and S2) to determine which preparation method works best.

អនុវត្តន៍ បន្ទាន់ ឱ្យ ខ្សោយ

Conclusion

In the process of exploring Zhangpu paper-cut art materials, we try to use kelp as one of the main raw materials for making paper. Kelp, as a rich natural resource, its unique texture and environmental protection characteristics let us have high hopes. However, after actual production and testing, we found that paper made from kelp has some significant limitations, especially when used for detailed paper-cut art creation. First of all, the kelp paper presents a distinct bumpy texture after drying. While this natural texture may be seen as a unique aesthetic in some artistic creations, in paper-cut art, this uneven surface can seriously affect the precision of cutting. Paper-cut art requires paper to have a smooth surface so that artists can accurately perform complex cutting work, and this feature of kelp paper makes it difficult to meet this basic requirement. Second, the fragility of kelp paper is another important limitation. In the paper-cutting process, the paper needs to have a certain strength and durability to withstand meticulous cutting and folding operations. However, kelp paper becomes extremely fragile and easy to break after drying, which makes it extremely vulnerable to damage during complex pattern cutting and unable to complete fine works of art. In addition, kelp paper lacks the necessary toughness, which is a property particularly needed in the art of paper cutting. Good toughness not only means that the paper can be folded multiple times without breaking, it also means that it is able to keep its shape and structure stable during shearing. Unfortunately, the performance of kelp paper at this point is not satisfactory, and its fragility and lack of elasticity limit its application in paper cutting art.

Although kelp has great potential as a sustainable resource in many fields, the above characteristics indicate that it is not suitable as a material for paper cutting art. This discovery prompted us to continue to explore and test other types of natural materials to find the ideal paper that is both environmentally friendly and suitable for the creation of paper-cut art. In future research, we will consider the physical properties of plant raw materials and the improvement of processing technology, with a view to discovering environmentally friendly paper that is more suitable for the art of paper cutting.

4.3.2 Laver paper

General characteristic

Porphyra, an aquatic plant belonging to the *Porphyra* family of Bangiales and Rhodophyta in *Planta*, can be subdivided into 129 species according to AlgaeBase classification. Hence the Latin name *Porphyrasp*. Collectively represent. Among them, some varieties can be eaten after processing because of their high nutritional value, common ones include: *Porphyratenera*, *Porphyrayezoensis*, *Porphrahaitanensis*, *Porphyrasuborbiculata*, *Porphyradentata* and so on. Nori usually exhibits a thin, flat, and leafy appearance. It is usually translucent and varies in color from dark purple to greenish-black. Its structure is delicate but somewhat tough, allowing it to withstand the harsh Marine environment. Flakes vary in size, with some species growing very large, but they generally maintain a consistent thinness. This physical structure not only contributes to its unique texture, but is also able to efficiently absorb nutrients from the water.

porphyratenera (*porphyratenera*) *porphyratenera* is an algal body of algae, the algal body is purple, generally 12 to 30 cm high, and the longest cultured *porphyratenera* is more than 4 meters. Distributed in Liaoning Peninsula, Shandong Peninsula and Zhejiang, Fujian coastal. North Korea and Japan also produce. Laver is a red algae plant, growing on the shallow sea rocks, the color dividends purple, green purple and black purple 3 kinds, after drying are purple, because of the name laver can enter the dish. It is the thallus of *porphyra glycyrrhizae*. Laver, taxonomically belonging to the phylum Rhodophyllum, is one of the important objects of seaweed cultivation in China. The morphological changes of porphyroporphyrine algae are relatively large, ovate, bamboo leaf shape or irregular round, the body height is generally 20-30 cm, a few can reach more than 60 cm, a few can reach more than 30 cm wide 10-18 cm. Color purplish red, purple or purple blue. The base is cuneate or heart-shaped, the margin is slightly wrinkled, the marginal cells are arranged flat, the alga is thin, the thickness is 20-30 cm, the monolayer cells, the pigment is single, the monoecious.。

Chinese name: Gan Laver

Latin name: *porphyra tenera*

Kingdom: The plant kingdom

Phyla: Rhodophyta

Subphyla: Caryophyliae

Class: Protored algae

Subclass: Phyllotrichia

Order: Rhodophyllales

Family: Rhodophyllaceae

Genus: Laver

Species: Sweet laver



Figure 119 *porphyra tenera*

source: Cui BaoLi 2023

porphyra tenera, a member of the *porphyra* genus in the Rhodochaetaceae family, is quite effective in preventing cancer. Promorphophyllum is a flat thallus with a short stalk. The thallus growing from the stalk is broadly lanceolate or elliptic, membranous, thin and translucent, with undulating edges. The growing season of laver is from November to May. Because laver is purple in the sea and when dried, it is called laver. Laver originated in the coastal areas of China, is a kind of seaweed growing in the tide, its distribution range covers the cold zone, temperate, subtropical and tropical waters, in China, mainly distributed in the Yellow Sea and Bohai Sea to

the southeast coast of the tide zone, a small number of distribution in Taiwan and Hainan Island coast. The thallus of porphyry mostly grows in the intertidal zone, the sea area with large wind and waves, smooth current and abundant nutrients, strong dry resistance, and wide adaptability to the specific gravity of sea water. The reproduction methods of laver include sexual reproduction and asexual reproduction. "Compendium of Materia Medica" recorded in laver: "hot air vexed throat, boiled juice drink, disease gall beriberi, appropriate to eat." Porphyra polysaccharide and phycobilin have anti-aging, anticoagulant and hypolipidemic effects. Laver is rich in dietary fiber, a variety of vitamins and calcium, potassium, magnesium and other trace elements, known as "magnesium treasure house". In addition, the phycobilin, which is unique to seaweed, has high nutritional value, is a kind of Marine food, and is also a pillar product of the rural economy in the southeast coast of China.

As early as 1400 years ago, the Northern Wei Dynasty of China "Qi Min Yao Shu" has mentioned that "Wu capital seaside mountains, raw laver", as well as the way to eat laver. The Tang Dynasty Meng Shen's "diet herbal medicine" has the record of seaweed "raw in the South China Sea, positive blue, with stone, and dry purple". By the Northern Song Dynasty, laver had become a precious food for tribute. In the Compendium of Materia Medica, Li Shizhen of the Ming Dynasty not only described the form and collection methods of laver, but also pointed out that laver was used to treat "hot air vexed the throat" and "where gall congeals the disease, it is suitable to eat laver regularly". Farming has a long history. Japanese fishermen may have collected natural seedlings from bamboo branches and branches in the first half of the 17th century, and then cultivated them with bamboo curtains and natural fiber horizontal mesh curtains. For a long time, laver seedlings can only rely on natural growth and limited sources, so the scale of breeding activities is not large. In 1949, British K.M. Drew first discovered that the very important growth period of fruit spores in the life of laver was spent in the shell, which opened up the way for the study of the source of natural seedlings. Then, in 1953 and 1955 respectively, Somasao Kuroki of Japan and Zeng Chengkui of China revealed the whole life history of laver, which laid a theoretical foundation for artificial seedling cultivation. Since then, laver farming has entered the full artificial production period.

Papermaking experiment

In order to ensure the diversity of experimental results, three groups of laminaria papermaking experiments were designed.

Experiment 1 : Leaf Sheet (p1)

- 1、Collect laver leaves.
- 2、Shred the laver leaves directly and splice them into the desired shape.
- 3、To press it, to shape it.
- 4、Dry to make paper.
- 5、The experimental data and observations were recorded.

Experiment 2 : Crushed Leaves (p2)

- 1、Collect laver leaves.
- 2、Cut into pieces.
- 3、The pieces were fermented and the fermentation time was recorded.
- 4、The fermented laver slices are made into pulp.
- 5、Carry out the papermaking process.

6、Dry to make paper.

7、The experimental data and observations were recorded.

Experiment 3 : Boil the Pulp (p3)

1、Collect laver leaves.

2、Crush the blades.

3、Boil the crushed leaves without adding any chemical reagents for two hours.

4、Rinse well and crush with a high-pressure water gun.

5、The laver is filtered and the extract is used as pulp.

6、Carry out the papermaking process.

7、Dry to make paper.

8、The experimental data and observations were recorded.

The results of each experiment can be numbered with p1, p2 and p3 to facilitate data statistics and comparison. When recording data, indicators such as the texture, strength, and color of the paper can be included, and comparative analysis can be performed to determine which preparation method is the best.

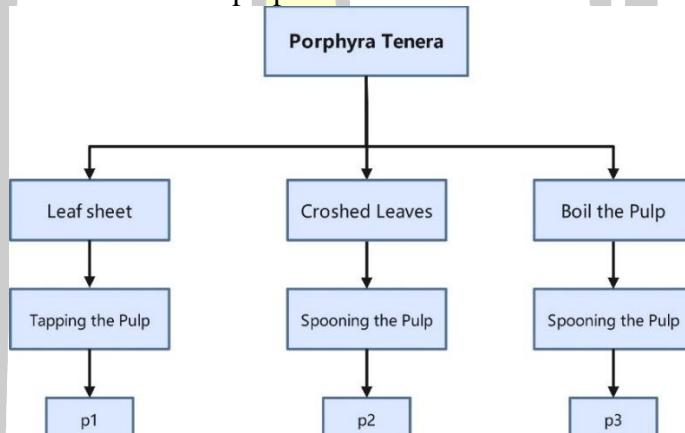


Figure 120 porphyra tenera paper experiment design

source: Cui BaoLi 2023

Experiment 1: LeafSheet(p1)- Preparation of laver leaf paper

Step 1: Pulverize the collected dried laver leaves, then put them into a container, inject water for cleaning, and clean off the mixed dirt until the water becomes clear. Then infuse the laver with water to soak, soak for 1 hour, so that the laver leaves fully absorb water, become full and transparent.



Figure 121 Chop up
source: Cui BaoLi 2023



Figure 122 Waterfermentation
source: Cui BaoLi 2023

Observe soaked laver, laver leaves fully absorb water, become full, showing light purple, some leaves appear translucent state



Figure 123 Leaves after fermentation
source: Cui BaoLi 2023

Step 2. Prepare a large basin or water container to ensure that the paper mesh can be placed under the container, and inject water into the container to ensure that the water can not reach the depth of the paper mesh.



Figure 124 Prepare the birdbath and strainer
source: Cui BaoLi 2023

Step 3. Wash out the soaked laver leaves in a container and pour the laver leaves into the paper making net so that the paper making net is full of leaves.



Figure 125 Filtered pulp
source: Cui BaoLi 2023

Step 4. Stir the laver into the net thoroughly by hand, so that it can be evenly distributed in the net.



Figure 126 The pulp is evenly coated
source: Cui BaoLi 2023

Step 5. Lift the net full of seaweed perpendicular to the surface of the water .



Figure 127 Loss of water
source: Cui BaoLi 2023

Step 6. Place the net at an Angle to let the water flow out of the laver and let it stand for about 1 hour.



Figure 128 Loss of water
source: Cui BaoLi 2023

Step 7. Place the preliminary filtered water net on the storage rack for airing. Do not dry in direct sunlight or high temperature environment. The net should be placed in a cool and ventilated place to dry naturally.



Figure 129 Air dry
source: Cui BaoLi 2023

Step 8, after 3 days of drying, the layer has been fully dried, at this time to observe whether it is successful, and try to take out the paper for retention.

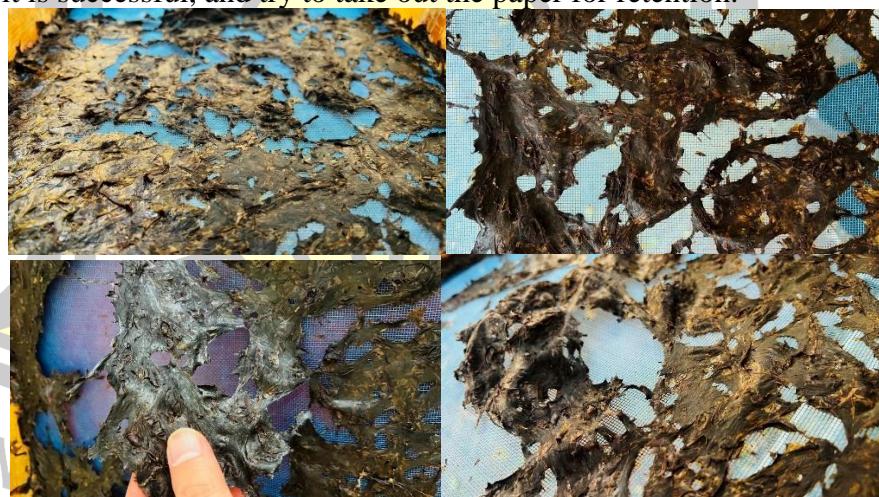


Figure 130 Finished detail close-up
source: Cui BaoLi 2023

Experiment 2: Crushed Leaves (p2)



Figure 131 Tear to pieces
source: Cui BaoLi 2023



Figure 132 cleanse
source: Cui BaoLi 2023

Experiment 2: Crushed Leaves (p2) - Preparation of fermented laver paper
Step 1. Pulverize the dried laver, then put it into a container, rinse with water, and rinse off the excess impurities. Then soak the laver in water, making sure that the water is fine.



Figure 133 Waterflood fermentation
source: Cui BaoLi 2023

Step 2. Ferment, immerse the laver in water and leave it for 48 hours. Let it ferment naturally. As shown in the picture, after 48 hours of fermentation, the laver has changed color, and the water soaked in the laver has turned a bright ochre color. Stirring will produce a large amount of foam, accompanied by a pungent smell.

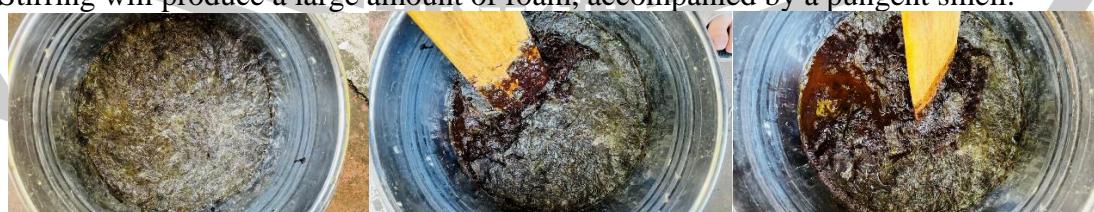


Figure 134 Observe the fermentation effect
source: Cui BaoLi 2023



Figure 135 Observe the fermentation effect
source: Cui BaoLi 2023



Figure 136 Observe the fermentation effect
source: Cui BaoLi 2023

Step 3, paper, use a container to fermenting laver, pour into the prepared net, ensure that the laver can be filled with the whole net, and then quickly stir the hand on the net, so that the laver evenly dispersed in the net, rest for 10 seconds, and then the net vertically raised to the surface of the water. Let the water in the net drain naturally. When the moisture is lost, place the net on the drying rack.



Figure 137 Clean the filter pulp
source: Cui BaoLi 2023



Figure 138 Clean the filter pulp
source: Cui BaoLi 2023



Figure 139 The pulp is evenly coated
source: Cui BaoLi 2023



Figure 140 The pulp is evenly coated
source: Cui BaoLi 2023

Step 4. When drying, ensure that the paper cannot be curled due to rapid dehydration in a high temperature environment and direct sunlight, and a complete paper cannot be formed. It should be kept in a cool and ventilated place and allowed to dry naturally.



Figure 141 Air dry
source: Cui BaoLi 2023

Step 5, out of the paper, after 72 hours of natural drying, has ensured that the water in the pulp fully evaporated. We now observe the paper in the net. The surface of the paper presents a complex texture, and there are obvious cracks and spalling phenomenon, these cracks are random, due to the evaporation of water, resulting in cracks. Touching the paper with your hand can easily break it, indicating that it is very fragile and has a certain fragility and toughness. The color is a deep ripe brown. Try to remove the paper because it is heavily cracked and the paper is very fragile. It becomes more damaged during the paper removal process, and it is not possible to remove the complete paper, only the incomplete paper fragments can be removed.



Figure 142 Paper detailing
source: Cui BaoLi 2023

Experiment 3: BoilthePulp (p3) - Preparation of steamed laver paper

Step 1, collect dried laver leaves, because the laver leaves are dry, so it is relatively crisp, you can directly use your hands to tear the dried laver leaves, shred into about 2-3cm pieces. The shredded nori leaves were placed in a container, and the researchers placed the fragments in an iron tube. Then soak and rinse with clean water, so that the dried seaweed fully absorbs water and expands, becoming soft and thin. In this process, water can be continuously injected to clean the laver debris, cleaning away excess magazines and dirt. Ensure the cleanliness of materials during pulp production. From the picture, we can see that the leaves of laver soaked in water have changed, and the color has changed from dark purple at the beginning to light purple or leaves with a little green.



Figure 143 Tear a leaf
source: Cui BaoLi 2023



Figure 144 Tear a leaf
source: Cui BaoLi 2023



Step 2. Add enough clean water to the laver leaves, the water should be over the laver leaves, and the depth of the laver leaves is about 10cm. At the same time, make sure that the water cannot overflow the iron bucket, and keep a certain distance from the edge of the iron bucket to prevent the water from overflowing the iron bucket when boiling, resulting in material loss. It also prevents hot water from splashing out of the iron bucket and scalding the staff. After that, the iron bucket is placed on the gas stove, and the fire burns vigorously, so that the water quickly reaches the boil, and then turn the heat down to cook slowly. Make sure the water is always boiling. The small fire should not be too small or too big. Then observe the change of the laver and record the boiling time. The duration is 120 minutes. Keep the water from boiling over at all times during the boiling process, and stir frequently to ensure that the nori is heated evenly.



Figure 145 water
source: Cui BaoLi 2023



Figure 146 Bring to a boil over high heat and reduce to a simmer
source: Cui BaoLi 2023



Figure 147 Boiling process
source: Cui BaoLi 2023

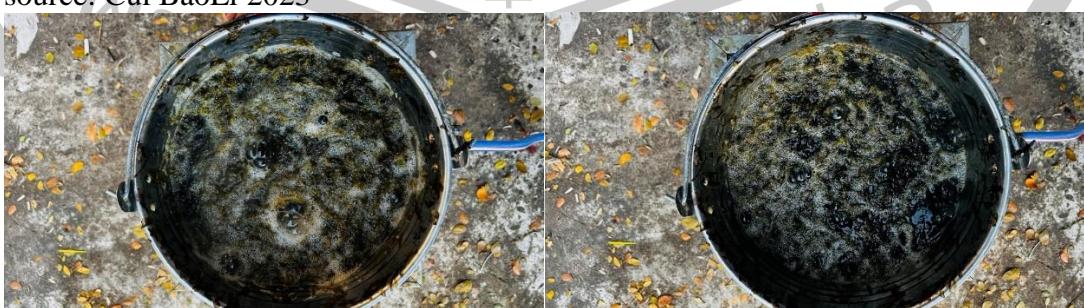


Figure 148 Boiling process
source: Cui BaoLi 2023



Step 3. Prepare the filter screen for filtering in advance, prepare a frame with a gap, and put the filter screen into the frame, which can support the filter screen for filtering. Place the frame into a large basin to hold the filtered water to observe the water composition. Then pour the boiled nori into the strainer, and the water will flow into the basin through the strainer. Wash the laver with clean water, and the clean water also flows into the basin through the filter. We look at the filtered water in the basin to see if there is any laver residue or debris loss. It was found that the filtered water was slightly green in color, and the water was clear and transparent, indicating that it did not contain residue or debris. In this way, the water can be safely thrown away, and then continue to clean the cooked laver with water repeatedly, so that it becomes clean and pure. After many times of cleaning, we can pick up the laver with our hands to observe, and find that the laver still retains the complete leaves, and the color is light purple and light green. The leaves are slightly transparent after boiling.



Figure 149 Pour the pulp into the strainer
source: Cui BaoLi 2023



Figure 150 Pour the pulp into the strainer
source: Cui BaoLi 2023





Figure 151 Rinse the pulp with water
source: Cui BaoLi 2023

Step 4. Use a high-pressure water gun to crush the washed layer under high pressure. This researcher used a high-pressure water gun with a pressure of 1000pa. Keep the material in the mesh and in the frame, because the high-pressure water will break the material into fine particles, and the frame needs to be placed in a container to prevent the water from carrying the debris away. We need to collect the water through containers and then filter the water. When everything is ready, the water gun is aimed at the material, and the impact is moved according to the way of up and down, left and right, or drawing a circle, to ensure that the material can be evenly crushed. This process requires repeated operations, and when the water in the container becomes less than the material, it needs to be poured out and collected into a larger container. This is repeated until the material is almost completely crushed. This process is to ensure that the material can be fully used.



Figure 152 Water gun
source: Cui BaoLi 2023



Figure 153 The high pressure water gun impinges the pulp
source: Cui BaoLi 2023



Figure 154 The high pressure water gun impinges the pulp
source: Cui BaoLi 2023

We can look at the filtered water, there will be a lot of foam, attached to the surface of the foam with a high pressure water gun to break up the debris, we slowly wait for the foam to disappear. Then you can put the water in your hand and observe that the water is rich in seaweed crumbs, and these crumbs are the raw materials we need to collect.



Figure 155 The foam produced when the water gun hits the pulp
source: Cui BaoLi 2023



Figure 156 The foam produced when the water gun hits the pulp
source: Cui BaoLi 2023



Figure 157 Pulp after water gun impact
source: Cui BaoLi 2023



Figure 158 The mixture after the water gun hits the pulp
 source: Cui BaoLi 2023



Figure 159 The impact of the high pressure water gun makes the pulp dissolve in water and the pulp becomes less
 source: Cui BaoLi 2023



Figure 160 After repeated shocks, the pulp almost completely disappeared
 source: Cui BaoLi 2023

Step 5, filtration, through repeated high-pressure water gun crushing, we collect the water containing debris, and then need to filter to make pulp. When filtering, we must choose the appropriate filter screen, if the filter screen hole is too large, it will cause the loss of pulp. If the filter screen is too small, it will increase the time cost of filtering. This step can be done several times to choose the appropriate filter. In this study, a smaller filter screen was selected to ensure the collection of pulp. As shown in the picture, pour the water into the strainer and use the hole frame as a support. When the filter is full, let it rest for about 12 hours to allow the water to be fully lost to obtain a purer pulp.



Figure 161 Strain the pulp mixture

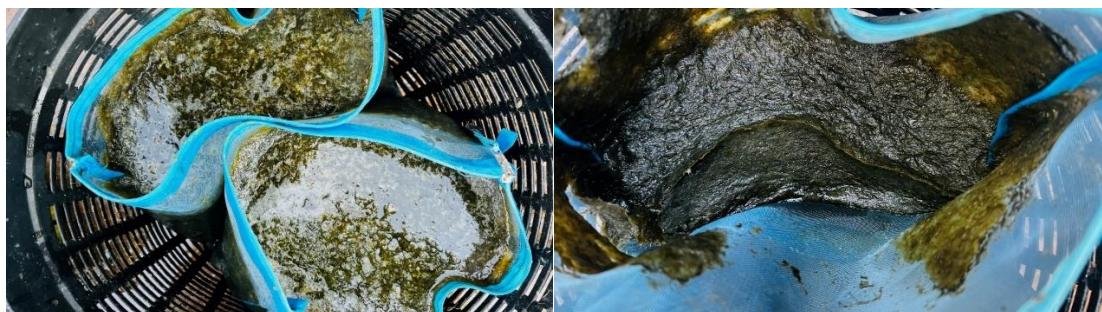


Figure 162 Strain the pulp mixture
source: Cui BaoLi 2023



Figure 163 Get pure pulp
source: Cui BaoLi 2023

Step 6, paper, this piece of wet, sticky material, is the processed seaweed pulp. Its color is dark green or dark green, the surface is somewhat shiny, and the texture looks elastic and somewhat sticky. We will experiment with the pulp for paper making. We weigh 500g of paper pulp, and then put the pulp into the prepared paper mesh and birdbath, the water in the birdbath must be able to pass through the paper mesh. Use water to evenly disperse the pulp into the water, the action should not be too large, so as not to spill the pulp to the outside of the paper mesh. After the pulp is evenly dispersed into the paper mesh, the bottom vertical Angle of the net is raised to the water surface, and when the water on the net disappears, the net is placed next to it, and the tilted position is placed so that most of the water in the pulp can flow out. Wait about an hour, then place the netting on a drying rack. Ventilation should be ensured to increase the evaporation of water. The net must not be placed directly under the sun, to avoid direct sunlight. Excessive temperature or direct sunlight will cause rapid dehydration of pulp, resulting in the effect of curling inequality, must be placed in a cool and ventilated place, let it dry naturally. It will take about 3 days to dry. We observe the effect after drying.



Figure 164 Pour 500 grams of pulp into the net
source: Cui BaoLi 2023



Figure 165 Loss of water
source: Cui BaoLi 2023



Figure 166 Air dry
source: Cui BaoLi 2023

Step 7, after 3 days of paper and drying, we observe whether the pulp on the paper net has been dried, if it has not been dried, continue to dry, if it has been dried, at this time we need to remove the paper. The method of taking the paper is to turn the paper net over and place it, and then press it hard along the border with the hand on the back, and move the edge along the border, so that the paper can be separated from the net. After the four sides are separated, the same method is slowly used from the four sides to the middle to press the net, so that the paper is fully separated from the net, and this step must be patient and careful. If you are not careful, the paper may be damaged, and the effort paid in front of it will be all in vain. Through the picture, we can observe that after drying the seaweed pulp, there are serious cracks, unable to form a complete paper, cracks are naturally formed in the drying process, irregular. To touch with the hand will find that it is very fragile, too much force will break into more fragments, the color is dark ink, completely different from the paper we usually see. This is an unsuccessful method of paper making and does not achieve the desired results.



Figure 167 Paper detail
source: Cui BaoLi 2023

Conclusion

In our attempt to use the local characteristic resource of Zhangpu, laver, to make handmade paper, we found that although laver, as a natural resource, is widely used in the food industry, it is facing many challenges in paper making. These challenges are mainly reflected in the physical properties of the paper, especially when they are used in the art of paper cutting, which requires high precision and durability.

First of all, the uneven problem of seaweed paper in the drying process is very obvious. The surface of the paper after drying is uneven, and this irregular surface texture may be able to add characteristics in some artistic creations, but in the art form of paper cutting, which requires extremely high precision and delicate operation, it will greatly reduce the fineness and aesthetics of the work. Paper-cut art requires paper to have a certain smoothness, so that artists can accurately implement detailed cutting and engraving, and this physical property of nori paper makes it difficult to meet this basic requirement. Secondly, we encountered a lot of sample production failures during the experiment. During the drying process, the seaweed paper is prone to cracks, which indicates that it lacks sufficient structural stability during the drying process. This vulnerability is fatal for the art of paper-cutting, because even a slight error in operation can lead to the damage of the paper, making it impossible to complete complex and delicate paper-cutting works. In addition, the paper made of seaweed is extremely lacking in toughness, which is a very important attribute in the art of paper cutting. Good toughness means that the paper can be folded and shaped many times without breaking, and this defect of laver paper makes it unable to fold many times or withstand the tiny pull in the process of paper cutting, which greatly limits its application in the art of paper cutting.

Based on the above observation and analysis, we conclude that although laver has its unique value as an environmentally friendly natural resource, the paper made from laver is not suitable for paper cutting art creation due to various limitations in its physical characteristics, such as uneven surface, easy cracking in the production process, and the fragility and lack of toughness of the finished product. This finding suggests that when we seek to innovate paper-cut art materials, we need to consider the various physical properties of materials comprehensively to ensure that they can reflect the concept of environmental protection and meet the high standards of artistic creation.

4.3.3 Mixed material paper making

Chinese name: Zhu

Latin name : Bambusoideae (Bambusaceae or Bamboo)

Foreign name: Bamboo

Kingdom: The plant kingdom

Door: Angiosperms

Class: Monocotyledonous plant class

Order: Graminea

Family: Gramineae

Subphyla: Angiospermophyta

Subclass: Bambusinae

Varieties: spotted bamboo, bamboo, bamboo, etc

Distribution area: Distributed in tropical, subtropical to warm temperate zone. The name bamboo comes from its ancient character, whose ancient shape resembles a drooping bamboo leaf, which later evolved into the current Chinese character bamboo. China is the first country in the world to study, cultivate and utilize bamboo. In ancient times, there was no natural distribution of bamboo species in Europe, and there were only a few native bamboo species in North America. In the past hundred years, European and American countries introduced a large number of bamboo species from China and other bamboo-producing countries. Bamboo, bamboo shoots and other main bamboo products are produced in China, Indonesia and so on. Bamboo is widely used for food, clothing, housing and transportation, and today there are 1 billion people in the world who live on bamboo.

Bamboo is a fast-growing herb. Its bamboo leaves are narrow lanceolate, 7.5 ~ 16 cm long and 1 ~ 2 cm wide. The apex is acuminate, the base is blunt, the petiole is about 5 mm long, one side of the edge is smooth, the other side is small serrated and rough. Parallel pulse, secondary pulse 6 ~ 8 pairs, small transverse pulse is very significant; Leaf surface dark green, glabrous, abaxially light color, base with microhairy; Thin and brittle. Bamboo shoots are 10 ~ 30cm long, and the number of green sections of the adult bamboo body is generally between 10 ~ 15 sections.



Figure 168 Bamboo
source: Baidu Encyclopedia

Bamboo flowers are flowers like rice ears, different kinds of bamboo flower color is different, but the main color is yellow, green, white, some with red, pink and so on. But because they're wind-borne, they're not too bright. Each flower has three stamens and a pistil hidden inside the flower. When the pollen of the stamen falls on the stigma of the pistil, it forms a seed, which, when propagated, can grow new bamboo. After flowering, the stems and leaves of bamboo will turn yellow.



Figure 169 Bamboo flower

The underground stem of bamboo (commonly known as bamboo whip) is growing horizontally, slightly empty in the middle, and there are many nodes and dense, and many roots and buds grow on the nodes. Some buds grow into bamboo shoots that emerge from the ground and grow into bamboo, while others do not, but grow horizontally and develop into new underground stems. Therefore, bamboo is a piece of forest growth. Tender bamboo whips and shoots are edible. Bamboo propagated from seeds is very difficult to grow thick, and it takes decades to grow to the thickness of the original bamboo. Therefore, bamboo whips (that is, underground stems) are generally used to breed, as long as 3-5 years, it can grow to the specified thickness.



Figure 170 Bamboo shoot
source: Baidu Encyclopedia

In autumn and winter, bamboo shoots have not yet grown out of the ground, then dug out called winter bamboo shoots (yellow mud arch); In spring, bamboo shoots grow out of the ground and are called spring shoots. Winter bamboo shoots and spring bamboo shoots are common foods in Chinese dishes. In the spring, bamboo shoots wait in the dry soil for the spring rain. If there is a good rain, the spring shoots will grow out of the ground very quickly.



Figure 171 Bamboo shoot
source: Baidu Encyclopedia

Bamboo mostly prefers warm and humid climates and is abundant in tropical, subtropical and temperate regions. Bamboo is one of the forest resources. There are more than 1,200 species of bamboo plants in the world, which are mainly distributed in tropical and subtropical areas, and a few bamboo species are distributed in temperate and cold zones.

Bamboo is an evergreen (a few bamboo species are deciduous in dry season) shallow root plants, demanding high water and heat conditions, and very sensitive, the earth surface water and heat distribution dominates the geographical distribution of bamboo. Southeast Asia is located in the tropical and South tropical, but also by the

Pacific and Indian Ocean monsoon convergence of the impact of abundant rainfall, heat stability, is the ideal ecological environment for bamboo growth, but also the world's bamboo distribution center.

The current bamboo forest area in the world is about 22 million hm². The geographical distribution of bamboo in the world can be divided into three major bamboo areas, namely, the Asia-Pacific bamboo area, the American bamboo area and the African bamboo area, and some scholars also listed a single, Europe, North America introduction area." [2] Bamboo grows quickly after rain..



Figure 172 Bamboo
source: Baidu Encyclopedia

The historical development of bamboo papermaking has been a long and innovative process, especially in East Asia, especially in China. The development of bamboo paper is closely linked to the history of paper making in China, which reflects the evolution of paper making technology and its profound impact on culture and society. China is one of the first countries in the world to make paper. According to historical records, the Han Dynasty in the 2nd century BC already had rudimentary paper-making techniques. In 105 AD, CAI Lun during the Eastern Han Dynasty made major improvements in papermaking technology, making paper production more efficient and of higher quality. CAI Lun's improvements included the use of bamboo, bark, rags and other raw materials, which marked the official use of bamboo as a raw material for paper making. With the continuous improvement of paper making technology, paper has gradually become the main medium for writing and cultural communication. Bamboo paper is widely used in ancient Chinese literature, government records and artistic creation because of its strong texture and durability. From the Tang Dynasty to the Song Dynasty, as communication between China and the rest of the world increased, paper-making technology began to spread outward. By the Middle Ages, the production technology of bamboo paper had spread to Korea, Japan and some parts of Southeast Asia. With the arrival of the Industrial Revolution, beginning in the 19th century, the production of paper gradually realized mechanization. Although mechanized production has reduced the proportion of hand-made paper, bamboo is still an important raw material in paper production. In the late 20th and 21st centuries, with increased global concern for environmental protection and sustainable development, bamboo's importance in the paper industry as a fast-growing and renewable resource has once again increased. Nowadays, bamboo paper is not only limited to traditional uses, but also widely used in packaging, hygiene products (such as bamboo fiber toilet paper), art creation and other fields. In general, bamboo papermaking technology has not only experienced long-term development and improvement in history, but also made significant progress in modernization,

environmental protection, technological innovation and other aspects. This makes bamboo paper a mature, environmentally friendly and widely used product. With the development of globalization, bamboo paper has become a part of production around the world, especially in countries and regions that pay attention to environmental protection and sustainable development. The history of bamboo papermaking is not only the history of technological progress, but also the history of the development of human culture, economy and environmental consciousness. This history shows the use and respect of human beings for natural resources.

Paper making experiment with mixed materials

The innovative practice of mixing bamboo with kelp for papermaking is particularly important in the context of today's pursuit of environmental sustainability and technological innovation. First, from an environmental point of view, such mixed use can reduce dependence on a single resource, especially in terms of alleviating pressure on terrestrial forest resources. As a fast-growing renewable resource, bamboo, combined with kelp, a rich Marine biological resource, provides a viable solution for the paper industry to reduce its dependence on traditional wood resources. In addition, the use of kelp contributes to the value of Marine ecosystems and promotes the sustainable management of Marine resources. From a technical point of view, the application of this hybrid material may lead to new paper properties, such as improved durability, better mechanical strength or unique texture and color. Such technological innovations will not only improve the usefulness of paper, but may also open up entirely new artistic and design possibilities to meet the market demand for high-quality and versatile paper. Economically, the production of this new type of paper could be cost-effective, especially during raw material acquisition and handling. The use of kelp may reduce the overall production cost, while due to its unique physical and chemical properties, it may also improve production efficiency and paper quality, thus bringing more economic benefits to paper enterprises. Socioculturally, the promotion of this hybrid papermaking method has helped to raise public awareness of environmental protection and sustainable development. It shows how to achieve a win-win situation between environmental protection and economic development through innovative use of natural resources, and is likely to become an important development trend of the paper industry in the future. The mixed papermaking of bamboo and kelp is expected to be a model of how to improve product quality and economic efficiency through technological innovation while protecting the environment. This will not only promote the sustainable development of the paper industry, but may also inspire more innovative thinking about the integrated use of natural resources, providing inspiration for other industries. With the increasing global emphasis on environmental sustainability, this hybrid paper technology may be more widely recognized and applied, becoming an important development direction for the paper and environmental protection industry in the future.

The innovative practice of combining bamboo with laver to make paper is particularly important in today's context of environmental protection and sustainable use of resources. First, from the perspective of environmental sustainability, this approach embodies the thoughtful and efficient use of natural resources. The combination of bamboo, as a rapidly regenerating terrestrial resource, and seaweed, a Marine biological resource, not only reduces the dependence on traditional wood, but

also demonstrates the possibility of synergistic utilization of terrestrial and Marine resources. This approach has positive implications for the protection of both forest and Marine ecosystems and helps to reduce the burden on the ecological environment. At the technical level, the mixed papermaking of bamboo and laver may bring a series of new material characteristics and innovations in production technology. For example, the blended paper may have greater durability, improved water properties, or a unique texture. Such technological advances will not only improve the utility of paper, but may also provide new material options for artistic creation and design. At the same time, the use of nori in the papermaking process may promote the optimization of the process, improving production efficiency and environmental sustainability. From an economic point of view, the use of laver as a raw material for paper may reduce the overall production cost. As a low-cost raw material, the fusion application of nori has the potential to improve the cost efficiency of the paper industry while providing a competitive advantage. In addition, this unique hybrid paper may appeal to specific market segments, such as consumers with a special need for environmentally friendly materials, or the art market seeking high quality and uniqueness. On a social and cultural level, the promotion of this hybrid papermaking method may help to raise public awareness of environmental protection, especially in terms of sustainable resource use and Marine conservation. In terms of cultural innovation, the use of this mixed material paper for artistic creation or packaging design can add uniqueness and innovation to cultural products. In general, the practice of combining bamboo and laver to make paper not only provides new possibilities at the technical and economic level, but also has important value in the sense of environmental protection and social culture. This practice demonstrates the balance between the pursuit of environmental sustainability and economic efficiency, and foreshadows the possible future direction of the paper industry. With growing global concerns about environmental issues, this hybrid paper technology could become an important symbol of innovation and sustainability in the paper industry.

Mixed papermaking experiment

Experimental design

The paper making experiment of mixed materials was set up into two large experimental groups. The first group was the pulp mixing of kelp and bamboo (S+B). The second group was laver mixed with bamboo pulp (P+B). To mix the two materials, it is necessary to mix in different proportions, and record the effect of pulp production in different proportions. Finally, the paper is evaluated to select the most suitable pulp ratio for paper cutting. First of all, the first group of kelp and bamboo

អង្គន៍ បណ្តុះចំណែ

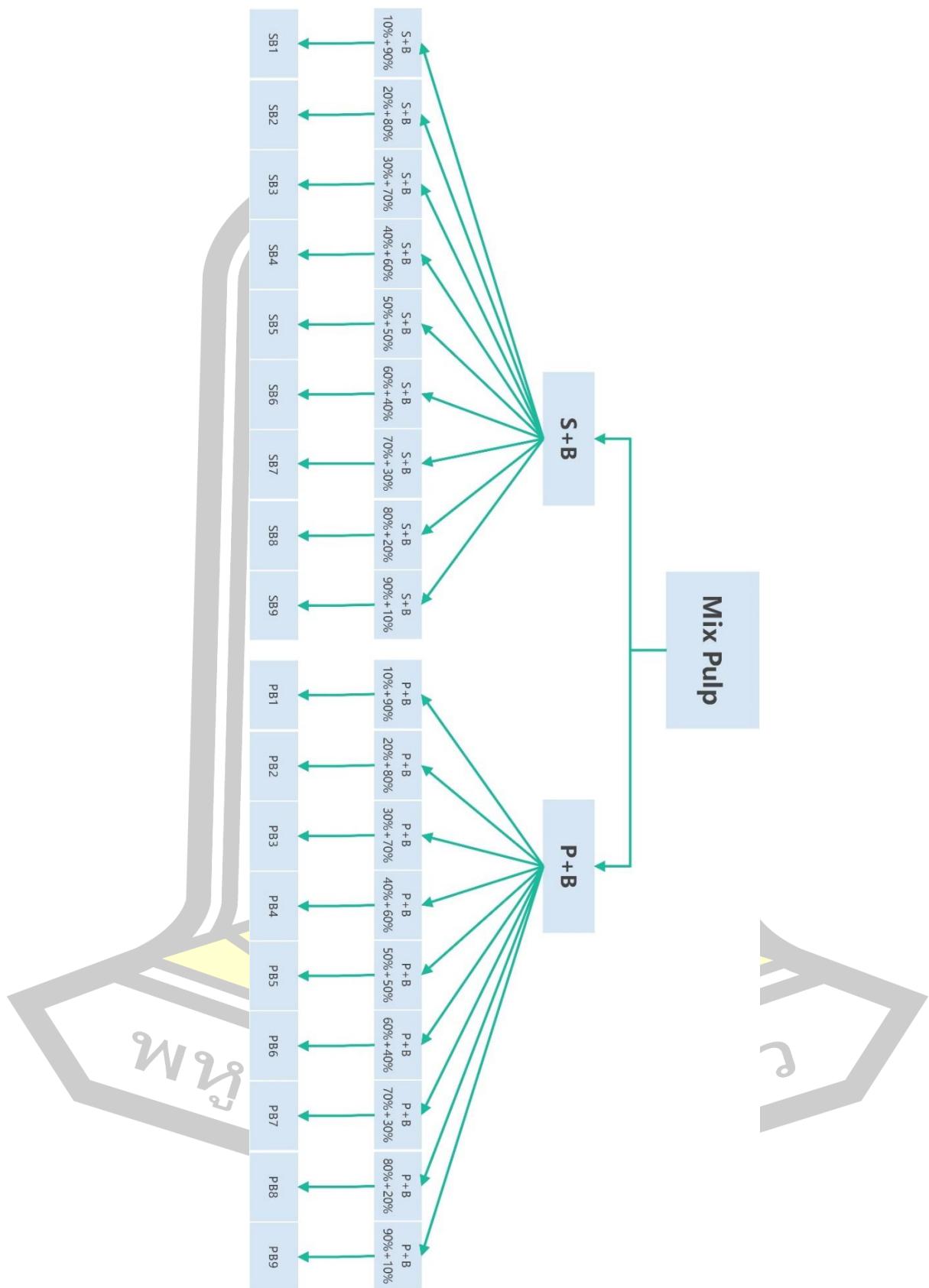


Figure 173 Mix pulp

Experiment 1: The first group of laminaria and bamboo mixed pulp experiment

Experiment 1.1 Production of kelp pulp

Step 1: Collect kelp leaves

Select dried kelp leaves, wash and soak, soak for 60 minutes. Kelp inhaled water into fresh kelp leaves, choose relatively intact kelp without damage.



Figure 174 *Saccharina japonica*
source: Cui BaoLi 2023

Step 2: Blade grinding

Using suitable tools, the collected kelp leaves were crushed into smaller pieces. In this study, the researchers used a kitchen knife to cut the pre-soaked and softened kelp leaves into small pieces. This step is crucial because it helps make it easier to handle. The cutting parts are approximately 2 cm in size, length and width and have been carefully selected to optimize the surface area for subsequent processing. After cutting, these pieces of paper undergo a thorough rinsing process to remove any impurities or excess salt, which is essential to maintaining the quality of the final pulp. The clean pieces of kelp can then be used in the next stage of pulp preparation, where they are further processed to convert them into a form suitable for paper making.



Figure 175 Chop the ingredients
source: Cui BaoLi 2023

Step 3: Bring to the boil

Place the cut pieces of kelp leaves into a large pot with enough water, then boil using a natural gas burner. The high temperature will quickly raise the water temperature and start the boiling process. After boiling, reduce the heat to maintain a mild simmer. This slow cooking method, which lasts about two hours or as needed for the experiment, can completely break down the kelp tissue. In the whole process, no

chemical reagents are added to ensure the natural treatment of kelp. The researchers must carefully monitor the transformation of the kelp during cooking and carefully record the time, which is usually set to 120 minutes. Emphasize safety precautions, especially to avoid burns from boiling kelp and water. The goal is to maintain the integrity of the experiment while ensuring the safety of the researchers involved. This detailed procedure emphasizes the importance of precision and safety in the experimental handling of kelp in pulp production.



Figure 176 Bring to the boil
source: Cui BaoLi 2023



Figure 177 Record of the boiling process
source: Cui BaoLi 2023

Step 4: Rinse

After completing the boiling process, the kelp pieces are thoroughly rinsed to remove any remaining impurities and contaminants. This step is done by placing the

cooked kelp pieces into a large basin and washing them repeatedly with clean water. Each rinse involves stirring the kelp in the water to loosen and wash away any remaining debris, ensuring that the kelp is completely clean. This meticulous washing not only improves the quality of the final product, but also prepares the kelp for subsequent processing steps. The rinsing process is essential to ensure that kelp pulp, once processed, is of the highest purity and suitable for its intended use.\



Figure 178 Rinse
source: Cui BaoLi 2023

Step 5: Crush

The cleaned pieces of kelp need to be further pulverized using a high-pressure water jet or similar effective tool to obtain a finer pulp, which is a key step in evenly dispersing the fibers. In this study, the process used a high-pressure water jet with a pressure of 1000pa. Crush the kelp into water and strain it. This crushing and filtering process is repeated until the kelp is almost completely crushed, ensuring a consistent and fine pulp suitable for high-quality paper production. This methodical approach increases the efficiency of fiber separation and helps to improve the overall quality of the final paper product.



Figure 179 High pressure water cannon
source: Cui BaoLi 2023



Figure 180 High-pressure shredding
source: Cui BaoLi 2023

Step 6: Filter

After the kelp is crushed, the resulting material is passed through a fine filter or screen to separate the pulp, which is a key step in the production of high-quality paper. Given the fine nature of crushed kelp, very fine mesh was used for filtration in this study to ensure that only the finest flesh was extracted. This process not only maximizes the amount of available pulp, but also improves the uniformity and quality of the paper to be produced. The careful selection of filter media reflects the meticulous approach required to convert kelp into a viable papermaking material.



Figure 181 filtration
source: Cui BaoLi 2023



Figure 182 pulp
source: Cui BaoLi 2023
Experiment 1.2 Production of bamboo pulp

Step 1, prepare the material, prepare the crushed bamboo fragments, and potassium permanganate chemical reagent. Note the ratio of bamboo to potassium permanganate. Requirement 4:1. 130g bamboo material requires a ratio of 32.5g potassium permanganate as an additive. Helps accelerate the dissolution and softening of bamboo fibers during the boiling process. Save energy.



Figure 183 weigh
source: Cui BaoLi 2023

Step 2. Wash and soak the bamboo. Put the prepared bamboo debris into an iron bucket and rinse it with clean water. Rinse the bamboo material clean of dirt. Wait until the water is clear. The bamboo is then soaked in clean water. Soak for about 30 minutes. Bamboo absorbs enough water to help soften the fibers during cooking.



Figure 184 Wash and soak
source: Cui BaoLi 2023

Step 3. Cook, place the soaked bamboo on the stove and heat it. Add the weighed potassium permanganate to the bamboo and heat it on high heat. Bring to a boil, then turn down the heat and cook slowly. Cook for 120 minutes.



Figure 185 Cooking
source: Cui BaoLi 2023



Figure 186 Changes in the material during cooking
source: Cui BaoLi 2023

Step 4. Clean, prepare a clean strainer and pour the cooked bamboo into the strainer. Rinse with clean water.



Figure 187 Wash with clean water
source: Cui BaoLi 2023

Step 5, high pressure cutting, prepare a high pressure water gun, this experiment uses a high pressure water gun with a water pressure of 1000pa, high pressure impact cutting on the cooked bamboo. Take care to put the bamboo in the strainer, and then put the strainer in the basket to ensure that the material does not spill. Then place the basket in a large birdbath. When cutting at high pressure, the material will be cut into fine fibers, to ensure that the fibers do not lose, but stored in the basin. Collect water containing fiber for filtration use.



Figure 188 High-pressure water gun cutting
source: Cui BaoLi 2023

Step 6, filter, the collected water with fiber, pour into the filter screen, filter out the water. All that's left is the bamboo pulp we need. Then keep the pulp in the shade to prevent moisture from drying out and keep the pulp moist. Get ready for the next step. Experiment 1.3

According to the following pulp mixing ratio table, the group papermaking experiment was carried out.

Pulp mixing ratio:

海带S	10%	20%	30%	40%	50%	60%	70%	80%	90%
竹子B	90%	80%	70%	60%	50%	40%	30%	20%	10%
ID	SB1	SB2	SB3	SB4	SB5	SB6	SB7	SB8	SB9

SB1 Experimental group

Kelp pulp 10% + bamboo pulp 90% = mixed pulp 100%



Figure 189 Mix pulp in a ratio of 1:9
source: Cui BaoLi 2023



Figure 190 made into paper
source: Cui BaoLi 2023

SB2 Experimental Group
Kelp pulp 20% + bamboo pulp 80% = mixed pulp 100%



Figure 191 Mix the pulp in a ratio of 2:8





Figure 192 Mix the pulp in a ratio of 3:7
source: Cui BaoLi 2023



Figure 193 made into paper
source: Cui BaoLi 2023
 SB4 Experimental group

Kelp pulp 40%+ bamboo pulp 60% = mixed pulp 100%



Figure 194 Mix the pulp in a ratio of 4:6
source: Cui BaoLi 2023



Figure 195 made into paper
source: Cui BaoLi 2023
 SB5 Experimental group

Kelp pulp 50%+ bamboo pulp 50% = mixed pulp 100%



Figure 196 Mix the pulp in a 5:5 ratio
source: Cui BaoLi 2023



Figure 197 made into paper
source: Cui BaoLi 2023
SB6 Experimental group

Kelp pulp 60%+ bamboo pulp 40% = mixed pulp 100%



Figure 198 Mix the pulp in a ratio of 6:4
source: Cui BaoLi 2023



Figure 199 made into paper
source: Cui BaoLi 2023
SB7 Experimental group

Kelp pulp 70%+ bamboo pulp 30% = mixed pulp 100% %



Figure 200 made into paper
source: Cui BaoLi 2023

SB8 Experimental group

Kelp pulp 80%+ bamboo pulp 20% = mixed pulp 100%



Figure 201 Mix the pulp in a ratio of 8:2

source: Cui BaoLi 2023



Figure 202 made into paper

source: Cui BaoLi 2023

SB9 Experimental group

Kelp pulp 90%+ bamboo pulp 10% = mixed pulp 100%



Figure 203 Mix the pulp in a ratio of 9:1

source: Cui BaoLi 2023



Experiment 2: The second group of laver and bamboo mixed pulp experiment

Experiment 2.1 Preparation of laver pulp

Step 1, collect dried laver leaves, because the laver leaves are dry, so it is relatively crisp, you can directly use your hands to tear the dried laver leaves, shred into about 2-3cm pieces. The shredded nori leaves were placed in a container, and the researchers placed the fragments in an iron tube. Then soak and rinse with clean water, so that the dried seaweed fully absorbs water and expands, becoming soft and thin. In this process, water can be continuously injected to clean the laver debris,

cleaning away excess magazines and dirt. Ensure the cleanliness of materials during pulp production. From the picture, we can see that the leaves of laver soaked in water have changed, and the color has changed from dark purple at the beginning to light purple or leaves with a little green.



Figure 204 Prepare the nori ingredients
source: Cui BaoLi 2023

Step 2. Add enough clean water to the laver leaves, the water should be over the laver leaves, and the depth of the laver leaves is about 10cm. At the same time, make sure that the water cannot overflow the iron bucket, and keep a certain distance from the edge of the iron bucket to prevent the water from overflowing the iron bucket when boiling, resulting in material loss. It also prevents hot water from splashing out of the iron bucket and scalding the staff. After that, the iron bucket is placed on the gas stove, and the fire burns vigorously, so that the water quickly reaches the boil, and then turn the heat down to cook slowly. Make sure the water is always boiling. The small fire should not be too small or too big. Then observe the change of the laver and record the boiling time. The duration is 120 minutes. Keep the water from boiling over at all times during the boiling process, and stir frequently to ensure that the nori is heated evenly.



Figure 205 Wash and soak
source: Cui BaoLi 2023

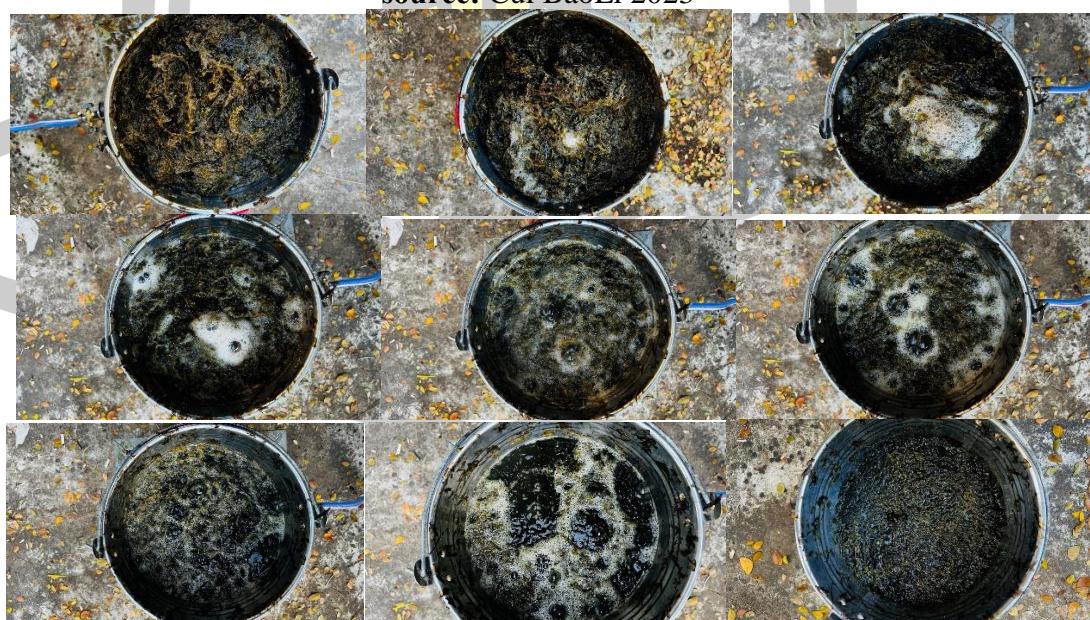


Figure 206 The process of heating and boiling seaweed varies
 source: Cui BaoLi 2023

Step 3. Prepare the filter screen for filtering in advance, prepare a frame with a gap, and put the filter screen into the frame, which can support the filter screen for filtering. Place the frame into a large basin to hold the filtered water to observe the water composition. Then pour the boiled nori into the strainer, and the water will flow into the basin through the strainer. Wash the laver with clean water, and the clean water also flows into the basin through the filter. We look at the filtered water in the basin to see if there is any laver residue or debris loss. It was found that the filtered water was slightly green in color, and the water was clear and transparent, indicating that it did not contain residue or debris. In this way, the water can be safely thrown away, and then continue to clean the cooked laver with water repeatedly, so that it becomes clean and pure. After many times of cleaning, we can pick up the laver with our hands to observe, and find that the laver still retains the complete leaves, and the color is light purple and light green. The leaves are slightly transparent after boiling.

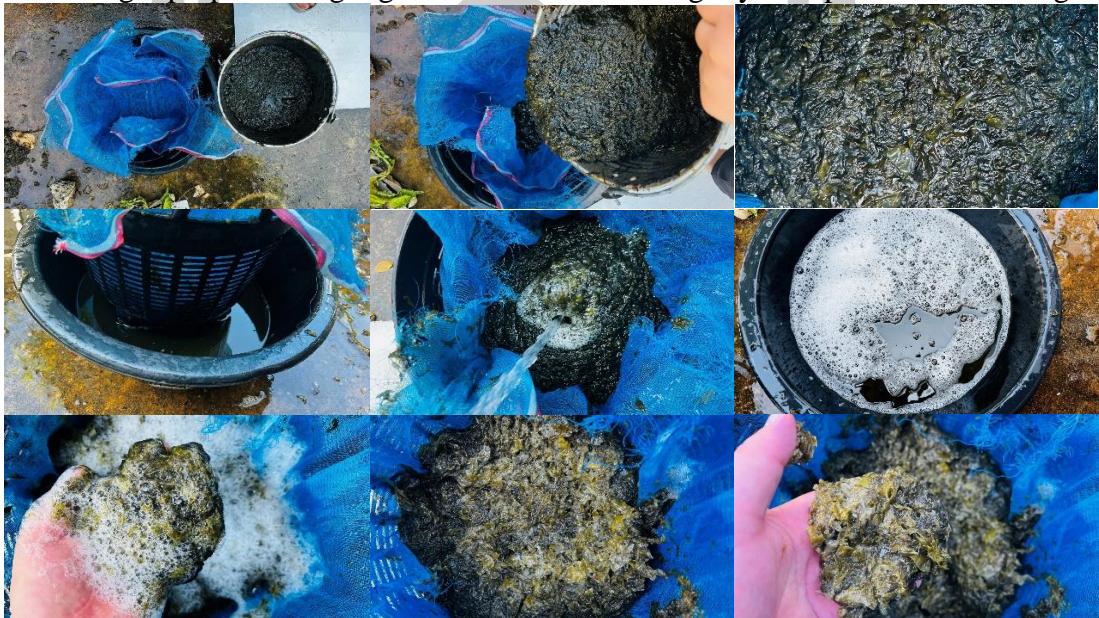


Figure 207 Wash and filter the boiled material
 source: Cui BaoLi 2023

Step 4. Use a high-pressure water gun to crush the washed laver under high pressure. This researcher used a high-pressure water gun with a pressure of 1000pa. Keep the material in the mesh and in the frame, because the high-pressure water will break the material into fine particles, and the frame needs to be placed in a container to prevent the water from carrying the debris away. We need to collect the water through containers and then filter the water. When everything is ready, the water gun is aimed at the material, and the impact is moved according to the way of up and down, left and right, or drawing a circle, to ensure that the material can be evenly crushed. This process requires repeated operations, and when the water in the container becomes less than the material, it needs to be poured out and collected into a larger container. This is repeated until the material is almost completely crushed. This process is to ensure that the material can be fully used.



Figure 208 High-pressure water gun cutting material
source: Cui BaoLi 2023

We can look at the filtered water, there will be a lot of foam, attached to the surface of the foam with a high pressure water gun to break up the debris, we slowly wait for the foam to disappear. Then you can put the water in your hand and observe that the water is rich in seaweed crumbs, and these crumbs are the raw materials we need to collect.



Figure 209 Liquid that melts into chips after cutting
source: Cui BaoLi 2023

Step 5, filtration, through repeated high-pressure water gun crushing, we collect the water containing debris, and then need to filter to make pulp. When filtering, we must choose the appropriate filter screen, if the filter screen hole is too large, it will cause the loss of pulp. If the filter screen is too small, it will increase the time cost of filtering. This step can be done several times to choose the appropriate filter. In this study, a smaller filter screen was selected to ensure the collection of pulp. As shown in the picture, pour the water into the strainer and use the hole frame as a support. When the filter is full, let it rest for about 12 hours to allow the water to be fully lost to obtain a purer pulp.

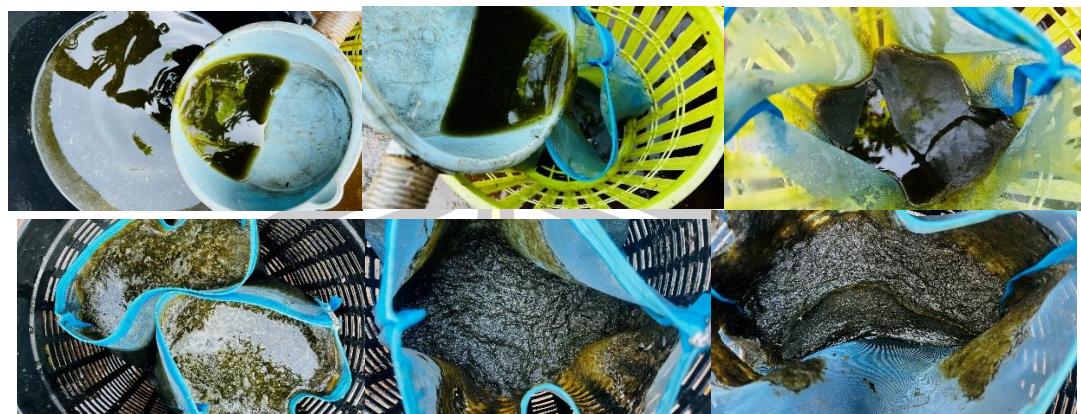


Figure 210 Filter and obtain pulp
source: Cui BaoLi 2023

Experiment 2.2

According to the following pulp mixing ratio table, the group papermaking experiment was carried out.

紫菜P	10%	20%	30%	40%	50%	60%	70%	80%	90%
竹子B	90%	80%	70%	60%	50%	40%	30%	20%	10%
ID	PB1	PB2	PB3	PB4	PB5	PB6	PB7	PB8	PB9

PB1 Experimental group

Laver pulp 10%+ bamboo pulp 90% = mixed pulp 100%



Figure 211 Mix the pulp in a ratio of 1:9
source: Cui BaoLi 2023



Figure 212 made into paper
source: Cui BaoLi 2023
PB2 Experimental group

Seaweed pulp 20%+ bamboo pulp 80% = mixed pulp 100%



Figure 213 Mix the pulp in a ratio of 2:8
source: Cui BaoLi 2023



Figure 214 made into paper
source: Cui BaoLi 2023
PB3 Experimental group

Seaweed pulp 30%+ bamboo pulp 70% = mixed pulp 100%





Figure 215 made into paper

source: Cui BaoLi 2023

PB4Experimental group

Seaweed pulp 40%+ bamboo pulp 60% = mixed pulp 100%



Figure 216 Mix the pulp at a ratio of 4:7

source: Cui BaoLi 2023



Figure 217 made into paper

source: Cui BaoLi 2023

PB5 Experimental group

Seaweed pulp 50%+ bamboo pulp 50% = mixed pulp 100%

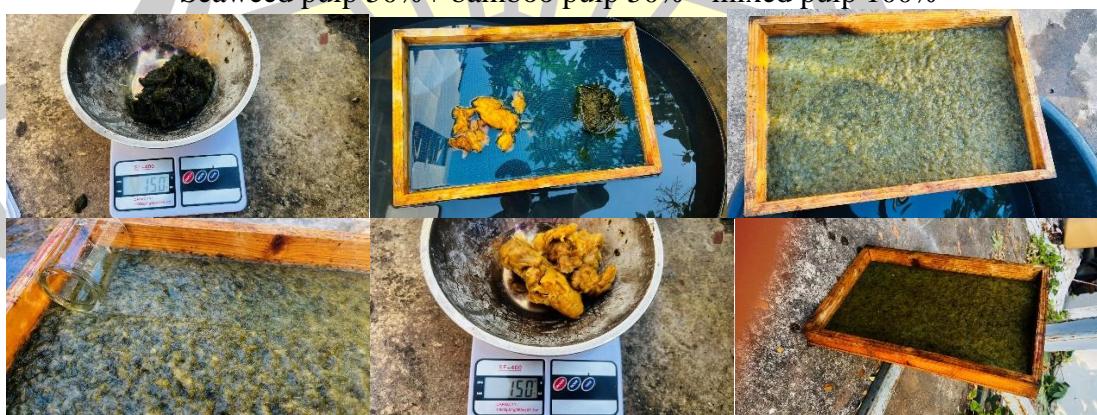


Figure 218 Mix the pulp in a 5:5 ratio

source: Cui BaoLi 2023



Figure 219 made into paper
source: Cui BaoLi 2023

PB6 Experimental group

Seaweed pulp 60%+ bamboo pulp 40% = mixed pulp 100%



Figure 231 Mix the pulp in a ratio of 6:4

source: Cui BaoLi 2023



Figure 232 made into paper

source: Cui BaoLi 2023

PB7 Experimental group

Seaweed pulp 70%+ bamboo pulp 30% = mixed pulp 100%



Figure 233 Mix the pulp in a ratio of 7:3

source: Cui BaoLi 2023



Figure 234 made into paper

source: Cui BaoLi 2023

PB8 Experimental group
Seaweed pulp 80%+ bamboo pulp 20% = mixed pulp 100%



Figure 235 Mix the pulp in a ratio of 8:2
source: Cui BaoLi 2023



Figure 236 made into paper

source: Cui BaoLi 2023

PB9 Experimental group

Seaweed pulp 90%+ bamboo pulp 10% = mixed pulp 100%



Figure 237 Mix the pulp in a ratio of 9:1

source: Cui BaoLi 2023



Figure 238 made into paper

source: Cui BaoLi 2023

Paper assessment (emphasizing that the papermaking material must be taken from Zhangpu, the universality or representative of this material in Zhangpu or not used, in order to prove that it can be used as a representative of Zhangpu)

Observation paper

The paper was sorted into laminaria bamboo group according to the number, including: SB1, SB2, SB3, SB4, SB5, SB6, SB7, SB8, SB9. Laver bamboo group: PB1, PB2, PB3, PB4, PB5, PB6, PB7, PB8, PB9. Analysis of paper by direct observation. In order to facilitate paper comparison, we make tables and summarize the data into the tables.

Table 1

ID	colour	texture	toughness	Sample 1(detail)	Sample 2(entirety)
SB1	A natural beige to light brown color, consistent with the unbleached and organic nature of kelp and bamboo fibers.	The paper texture appears rough and uneven, visible mixed fibers criss-cross in an irregular pattern, preserving the original structural integrity.	The fibers shown show that this paper has good tear resistance along the texture of the fibers.		
SB2	The paper has a natural beige to light brown tone with darker spots.	The texture is rough and uneven, with visible fibers and spots throughout.	It has a certain degree of toughness and tear resistance. The physical interlocking of fibers helps to improve the strength of the paper.		
SB3	It is mainly light brown with dark spots.	It looks very rough, with visible fibers and particles.	It has a certain degree of toughness and tear resistance. The physical interlocking of fibers helps to improve the strength of the paper.		

			paper.		
SB4	Natural beige to light brown with irregular dark spots	The surface of the paper is very rough, visible fibers and small particles can be seen.	Good structural strength. Long fibers can increase the tear resistance of the paper, making it tougher to withstand tension.		
SB5	It is mainly beige and light brown with black and dark brown spots. The color is uneven.	The surface of the paper is rough, and many fibers and particles of different sizes can be seen.	The fibers in the paper cross, which usually increases the strength and toughness of the paper.		
SB6	The main color of the paper is gray, mixed with irregular dark spots and light areas.	The surface of the paper is very rough, with a distinct grainy and fibrous texture. Suitable for special printing or art works.	The dense and disorganized fiber structure may mean that the paper has better tear resistance and structural strength.		
SB7	The tone of the paper is light gray, mixed with different shades of spots.	The surface of the paper is rough, the texture is clearly visible, there are a lot of fibers and small gaps.	The inside of the paper appears to have a more complex network of fibers, which usually provide strong tear resistance.		
SB8	The paper is mainly light gray and contains irregular dark spots.	The surface of the paper looks very rough, with obvious fibrous structure and particles.	The visible interlacing of fibers within the paper may mean that it has some strength and tear resistance.		
SB9	Mainly grey and brown tones, with dark and light spots.	The surface texture of the paper is very rough, with obvious fiber structure and small particles.	The fibers in paper are interleaved and dense, which usually increases the tear resistance and overall strength of the paper.		

Paper analysis summary, SB series of paper is a series of handmade paper made by mixing kelp and bamboo fiber. From the color analysis, most of the paper presents a natural beige and light brown tone, with the summary of kelp content, the color gradually from light to dark, from 10% of the kelp proportion of beige, to 90% of the seaweed proportion of brown. The fiber of kelp itself is dark brown, so the change in color is due to the change in the content of kelp. Most of the paper has dark spots or fibers, and starts with sparse spots of 10% kelp pulp, to patches of 90% kelp pulp or directly forming large brown areas. Looking closely, we can see that the dark spots on the paper are actually kelp fibers. Therefore, the increase of spots is directly caused by the increase of the mixing ratio of kelp pulp. The different pulp ratio leads to the different color of paper. This color is a color from nature. The paper has not

experienced any wandering or color processing process in the production process, and this color is directly influenced by the color of the material itself. This pure natural color has a certain uniqueness and artistry, which is very suitable for the creation of art works. In addition, this unique blend of kelp pulp also brings a certain texture and touch, which not only increases the aesthetics of the paper, but also enhances the sensory experience of the user. With the increase of kelp content, the texture of the paper also changes from soft and delicate to slightly rough, but it is still a warm and rich touch. This texture change also affects the toughness of the paper, kelp fiber increases the tensile strength of the paper, making the paper more durable under tension or pressure. Such characteristics make this paper not only visual enjoyment, but also show its superior physical properties in practical applications. At the same time, the advantages of the two fibers are complementary, and the vulnerability of kelp fiber and the toughness of bamboo fiber are reasonably integrated together. It not only ensures the toughness of the paper but also guarantees the plasticity of the paper. Overall, this paper made with a high proportion of kelp pulp, with its unique color, texture and strength, will be ideal for artists and environmental advocates.

Table 2

ID	colour	texture	toughness	Sample 1(detail)	Sample 2(entirety)
PB1	The paper is light brown with some dark dots and lines of impurities.	The surface of the paper is very rough, with a large number of obvious fibers and particles.	A dense and disorderly distribution of fibers is usually a sign of good toughness.		
PB2	The paper has a natural light brown hue with dark fibers and spots.	The surface of the paper is rough, showing an obvious fiber structure.	Paper is relatively strong and resistant to tearing. Interweaving between fibers usually increases the structural strength of the paper.		
PB3	The paper has a natural light brown color, mixed with dark brown and black spots.	Paper surface has obvious rough texture, fiber distribution is not uniform, there is a large granular feeling.	Paper is relatively strong and resistant to tearing. This interleaved fiber structure provides better durability and strength.		
PB4	The paper presents a light brown tone with darker brown and black spots.	The surface of the paper is very rough, with obvious fibrous structure and particles	Paper has high strength and tear resistance. Dense interweaving of fibers usually means that the paper is better able to resist physical stresses.		

PB5	The paper is light brown with dark spots and fibers.	The paper has a rough surface with a distinct fibrous texture.	The paper has a certain tear resistance. Fibers have dense and chaotic layout characteristics.		
PB6	The dominant color of the paper is light brown with dark spots and streaks.	The surface of the paper is very rough, with a distinct fibrous structure and irregular particles.	The obvious interlacing and density of fibers in the paper indicate that it may have good tear resistance.		
PB7	The paper shows a light brown hue mixed with dark spots and fibers.	The paper has an obvious rough texture, and you can see the fiber structure and small holes.	The fibers are intertwined to form a strong network, which generally provides a high degree of toughness.		
PB8	The paper appears in a variety of brown tones, from light to dark, with black spots.	The texture of the paper surface is very rough and irregular, showing a distinct fibrous structure.	Paper has a certain tear resistance. The dense interlacing of fibers usually increases the toughness of the paper, making it more durable.		
PB9	The paper is mostly yellow-brown with dark fibers and spots.	The surface of the paper is very rough and has a distinct fibrous texture.	The paper has good tear resistance. This physical structure usually means that the paper will be tougher in practical use.		

Paper analysis summary, PB series of paper is a series of handmade paper mixed with seaweed and bamboo fiber. From the color analysis, most of the paper presents a natural light brown tone, with the summary of the content of laver, the color gradually from light to dark, from 10% of the proportion of laver light brown, to 90% of the proportion of laver dark brown. The fibers of laver themselves are dark brown, so the change in color is due to the change in the content of laver. Most of the paper has dark spots or fibers, and starts with sparse spots of 10% laver pulp, to patches of 90% laver pulp or directly form a large area of dark brown. Looking closely, we can find that the dark spots on the paper are actually the fibers of the seaweed. Therefore, the increase of spots is directly caused by the increase in the mixing ratio of seaweed pulp. The different pulp ratio leads to the different color of paper. This color is a color from nature. The paper has not experienced any wandering or color processing process in the production process, and this color is directly influenced by the color of the material itself. This pure natural color has a certain uniqueness and artistry, which is very suitable for the creation of art works. In addition, this unique blend of seaweed pulp also brings a certain texture and touch, which not only increases the aesthetics of the paper, but also enhances the sensory experience of the user. As the content of

seaweed increases, the texture of the paper changes from soft and delicate to slightly rough, but it is still warm and rich to the touch. This texture change also affects the toughness of the paper, and the seaweed fiber increases the tensile strength of the paper, making the paper more durable under tension or pressure. Such characteristics make this paper not only visual enjoyment, but also show its superior physical properties in practical applications. At the same time, the advantages of the two fibers are complementary, and the fragility of the seaweed fiber and the toughness of the bamboo fiber are reasonably integrated together. It not only ensures the toughness of the paper but also guarantees the plasticity of the paper. Overall, this paper made with a high proportion of laver pulp, with its unique color, texture and strength, will be ideal for artists and environmental advocates.

4.4 Expert test feedback

Paper comprehensive evaluation

First of all, as can be seen from the figure, the surface of the paper is uneven, with a large number of uneven and granular structures. This indicates that the texture of the paper may be rough and fragile. Paper-cut art usually requires delicate, uniform and ductile paper to support fine cutting and folding, and this rough paper may be difficult to use for fine paper-cut works.

Secondly, the structure of kelp paper looks more loose and may not be strong enough. In the paper-cutting process, the paper needs to have enough strength to withstand cutting without breaking, so if the paper itself is fragile or fragile, then it may not be suitable for paper-cutting. Finally, paper-cutting art sometimes needs to fold and cut the paper many times, which requires the paper to have a certain flexibility. Kelp paper seems to lack this flexibility and may not be easy to fold and shape.

Expert evaluation

The research team took the papers to local paper-cutting artists in Zhangpu. The artists showed great interest in the new paper. They first made an initial evaluation of the paper by touch and vision, and gave a high rating to the texture, thickness and color of the paper. Later, artists began to actually use these papers to create paper cuts. In the process of paper-cutting, artists pay special attention to the shear properties of paper, durability and the display effect of the final work. They found that the paper mixed with nori and bamboo was not only easy to cut and accurate to complete complex paper-cut patterns, but the natural color and texture of the paper added a unique aesthetic to the work. More importantly, this paper shows good durability, even the subtle paper-cut parts are not easy to break.

Zeng Fangfang is a Zhangpu paper-cut artist and a non-genetic inheritor of Zhangpu paper-cut art in Zhangzhou City, Fujian province. An artist who has devoted himself to the paper-cut art of Zhangpu for many years. After she came into contact with the handmade paper made from a mixture of seaweed and bamboo, she was deeply attracted by its unique charm. The biggest advantage of this paper is that it perfectly combines the strength and toughness of bamboo and the flexibility of nori, so that the paper cutting can withstand the delicate blade operation, while maintaining the integrity and delicate sense of the work. In addition, the light seaweed fragrance and natural texture of this paper add an indescribable vitality and natural beauty to the paper-cut works. In my opinion, the emergence of this material not only provides

more possibilities for paper cutting art, but also makes our creation closer to nature and return to the origin of art. In particular, the paper made by mixing seaweed and bamboo in a ratio of 9 to 1 is a good choice in terms of color and toughness.



Figure239 Paper-cutting artist Zeng Fangfang
source: Cui BaoLi 2024

Ms. Lu Shurong, also a non-genetic inheritor of Zhangpu paper-cutting in Fujian Province, is an artist who focuses on the creation and teaching of traditional paper-cutting art. Lu said: "For me, the emergence of seaweed and bamboo mixed paper is not only an exploration of new materials, but also a perfect integration of culture and nature." This paper retains the toughness of bamboo and the delicacy of laver, making paper cutting not only more durable, but also more exquisite. Its natural material and color bring additional cultural meaning and aesthetic value to the paper-cut works. In teaching, I hope to recommend this kind of paper to students, because it not only improves the operability of paper cutting, but also enables students to get closer to nature in the creation process and feel the harmonious symbiosis between art and environmental protection. The development of this kind of paper, I think, is of great significance for promoting the inheritance and development of Zhangpu paper-cutting art."

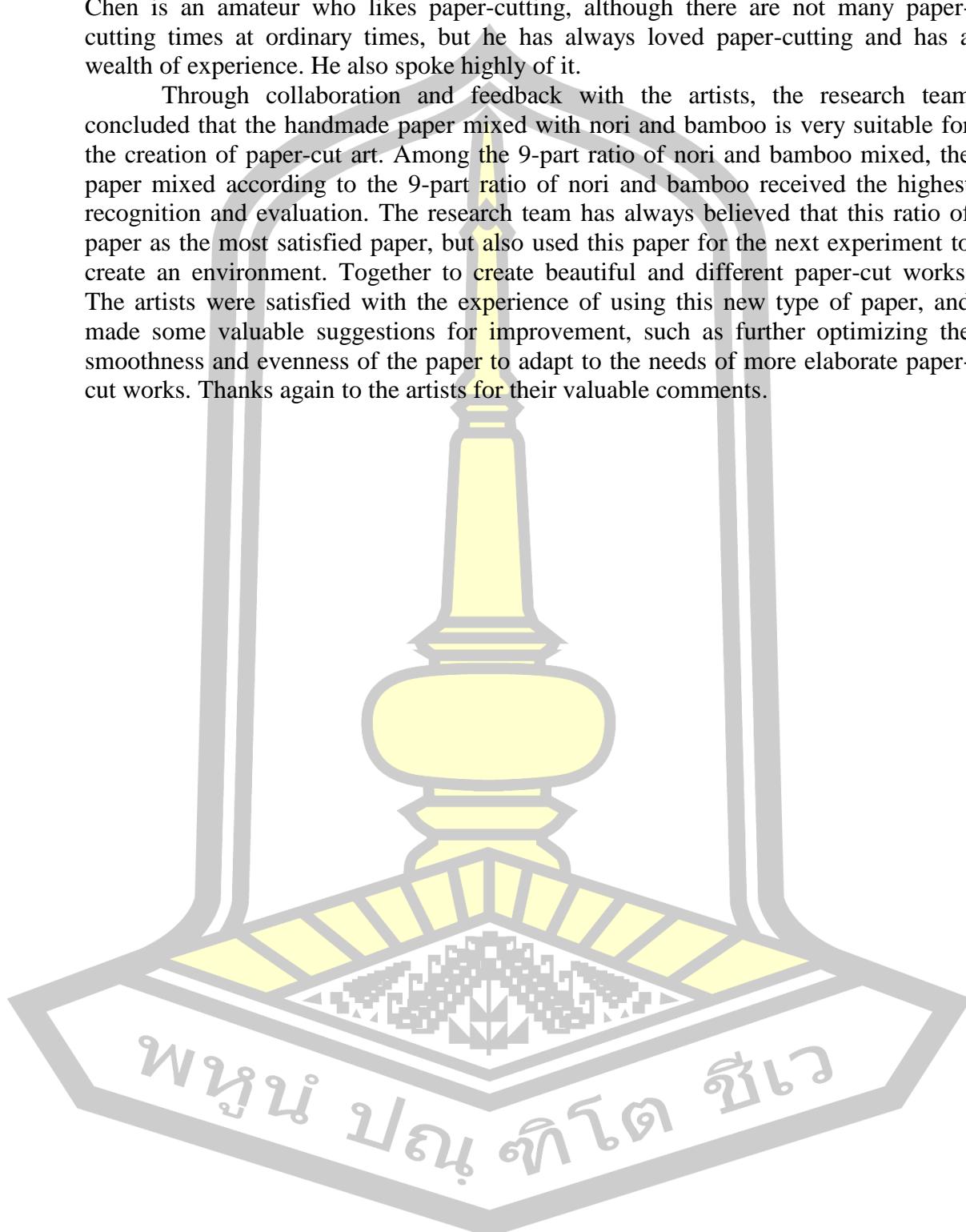


Figure240 Paper-cutting artist Lu Shurong
source: Cui BaoLi 2024

"My name is Chen Haiming, and as a paper-cutting artist who loves to explore new materials, I am impressed by this new type of paper. When using traditional paper, I often worry about accidental breakage during cutting, especially when dealing with extremely fine patterns. However, the paper mixed with seaweed and bamboo gave me a whole new experience. Its toughness is significantly improved, greatly reducing the risk of damage to the work during the creation process. What is more pleasing is that the natural texture and color of this paper make even the simplest paper-cut works show a unique artistic beauty. I think the development of this material is a big step in

the innovative development of paper cutting art." Chen Haiming teacher said. Mr. Chen is an amateur who likes paper-cutting, although there are not many paper-cutting times at ordinary times, but he has always loved paper-cutting and has a wealth of experience. He also spoke highly of it.

Through collaboration and feedback with the artists, the research team concluded that the handmade paper mixed with nori and bamboo is very suitable for the creation of paper-cut art. Among the 9-part ratio of nori and bamboo mixed, the paper mixed according to the 9-part ratio of nori and bamboo received the highest recognition and evaluation. The research team has always believed that this ratio of paper as the most satisfied paper, but also used this paper for the next experiment to create an environment. Together to create beautiful and different paper-cut works. The artists were satisfied with the experience of using this new type of paper, and made some valuable suggestions for improvement, such as further optimizing the smoothness and evenness of the paper to adapt to the needs of more elaborate paper-cut works. Thanks again to the artists for their valuable comments.



CHAPTER V

Pattern design and production of representative paper-cut works of Zhangpu community assets

5.1 Inspiration and research

In the process of designing paper-cut patterns, inspiration and research play a core role, they are the two engines to promote creativity and achieve creative success. Inspiration, as the spark of creativity, stimulates our imagination and helps us push the boundaries of traditional thinking. It may arise from the wonder of nature, the beauty of a work of art, the triviality of everyday life, or the depth of personal experience. These sources of inspiration allow us to break out of the box and create work that is individual and innovative. For example, flowers, insects, or weather phenomena in nature may inspire novel patterns and shapes in paper-cut designs. Works of art, such as ancient murals or modern paintings, may also inspire designers to explore different color combinations and textures. Ordinary objects in everyday life, such as architectural structures or street art, can also be transformed into innovative elements in paper cutting. Research, on the other hand, gives depth and context to the design, enabling the designer to gain a deep understanding of the historical, cultural and social significance of the selected element. This deep understanding not only gives a design a deeper meaning, but also enables it to resonate with a specific audience. For example, when designing paper-cuts associated with a particular region, a deep understanding of the region's history, cultural practices, and natural landscape can make the design work visually compelling while also conveying the unique stories and values of the region. Such works are not only a visual pleasure, but also a vehicle for education and cultural communication. Adequate research helps designers avoid cliches and pushes them to create new and engaging pieces. In-depth market research and user analysis reveal potential needs and unmet market Spaces, leading designers to explore innovative solutions. Understanding user needs, market trends and material properties can help improve the usefulness and attractiveness of the design. For example, when designing paper-cut for a specific festival, understanding the cultural background and traditional customs of the festival can make the design more close to the user's emotions and expectations. Design is essentially a form of communication. Through research, designers are able to better connect emotionally and culturally with their target audience. This is particularly important in brand design and advertising, where good research ensures that the message is clearly communicated while touching people's emotions and building a deep connection between the brand and the consumer. For example, when designing paper-cuts for a specific brand, a deep understanding of the brand's core values and the characteristics of the target audience can help designers create pieces that both fit the brand image and appeal to the target customer. In short, inspiration and research are an integral part of the creative process. They not only enhance the quality and depth of the work, but also contribute to the personal and professional development of the designer. Inspiration comes from our observation and experience of the world, and research provides a solid foundation and background for our

creativity. The combination of the two can stimulate innovative thinking and produce influential and meaningful design works. In paper-cut design, this combination is particularly important, because it not only affects the visual expression of the work, but also determines whether the work can convey the cultural essence and story at the same time, and have an emotional resonance with the audience. Through this process, the art of paper cutting is not only the cutting and splicing of paper, but has become a powerful way of cultural and artistic expression.

5.2 Ideation and sketching

Based on the collected information and inspiration, began to draft the preliminary paper-cut pattern design. This may include simple sketches and concept sketches to determine the general direction of the design and the combination of elements.

In the design of paper-cut patterns, the conception and sketch stage plays a crucial role. This stage is the basis of the entire creative process, ideation and sketching is the process of transforming abstract ideas into concrete visualizations. This stage helps designers articulate and organize their ideas. Through sketching, designers can explore different compositions, shapes, and patterns until they find the elements and layouts that best express their design intent. This process is extremely important because it is not only about aesthetic choices, but also about how to convey a particular message or emotion. For example, a designer may use a specific flower or animal image to convey a specific cultural symbol or traditional story.

The sketching phase allows designers the freedom to experiment and explore various possible design directions and creative combinations. It is a trial and error process that can be modified and adjusted without limit until satisfactory results are achieved. During this process, designers may experiment with many different combinations and layouts to find the design that best expresses their creativity and goals. For example, by adjusting the size, position, or color of elements in a pattern, designers can achieve different visual effects and emotional expressions. During the sketching phase, designers can identify potential problems and challenges in advance, such as excessive complexity, unstable structure, or insufficient detail. By identifying and solving these problems in the sketch stage, more complex difficulties can be avoided in the actual production of paper cutting. For example, some patterns may look attractive in design, but may be too fragile or difficult to achieve when actually cutting. Therefore, the designer needs to evaluate the feasibility of the pattern at this stage. Sketching is an effective tool for communicating design ideas to clients, colleagues, or other stakeholders. It helps others understand the visual concepts of the designer, thereby providing feedback and suggestions. This communication is essential to ensure that the design meets the intended goals and requirements. For example, customer feedback may prompt a designer to adjust certain aspects of a pattern to better meet market needs or a specific target audience. In the art of paper cutting, the sketch stage is also an important part of technical preparation. Designers need to consider the limitations of paper-cutting techniques, such as the strength of the paper and the feasibility of cutting. This ensures that the design is not only visually appealing, but also technically achievable. For example, a designer may need to choose the type of paper suitable for fine cutting, or adjust the details of certain patterns to ensure that they do not break during cutting. A sketch is a bridge from the initial idea to the final product. It provides a platform for designers to further develop

and refine their ideas on this basis. This process allows designers to continuously refine their ideas, while also providing an opportunity to document and review the creative development process. In some cases, the sketching phase may also spark new ideas and directions, leading to a major shift in design thinking. In short, the concept and sketch is an indispensable preliminary stage in the process of paper cutting design.

According to the representative community assets summarized in the investigation, the creation includes: The representative community assets of Zhangpu County include intangible cultural assets: Kaizhang Sacred King Sacrifice ceremony and Zhangpu puppet art. Material and cultural assets: West Lake Park and Wushi Mazu Temple. Natural assets Gulei coastal scenic tourist area one. There are five items in total.

First of all, we create the sacrificial ceremony of the holy king Chen Yuanguang. The King of Kaizhang, Chen Yuanguang (657-711 AD), was a Tang Dynasty general known as Chen Yuanguang for his pioneering work in Zhangzhou (now Fujian Province) and later revered as the King of Kaizhang. Chen Yuanguang was born into a family of generals in the Tang Dynasty. He trained martial arts as a child and was appointed governor of Zhangzhou by the Tang Court for his outstanding war achievements. Under his leadership, Chen Yuanguang led soldiers and civilians to reclaim wasteland, drive out wild animals, quell local disturbances, and establish a sound administrative system to promote local economic and social development. He made a great contribution to the development of Zhangzhou, so he was revered by later generations. Chen Yuanguang was not only an outstanding military general, but also a visionary politician and pioneer. In the process of developing Zhangzhou, he paid attention to the development of agriculture, promoted advanced agricultural technology, and improved the local production and living conditions. In addition, he also actively promoted education and improved the cultural level of the people, and was regarded as a national hero and local protector by later generations. Due to his remarkable achievements, after his death, Chen Yuanguang was revered as a deity and called the "Holy King of Kaizhang". He was widely worshipped by the people in Zhangzhou and other places in Fujian Province, and celebrations were held every year to commemorate his contribution to the local social and cultural development. His story has also become an important cultural symbol in Chinese history, influencing the evaluation standard of heroes and pioneers in later generations. In composition, the focus is on putting Chen Yuanguang in the center of the picture, and the central figure is the visual focus of the whole painting. The characters look directly at the viewer, enhancing the visual impact. The incense near the hand and its rising smoke guide the viewer's eye, adding to the vertical dynamics of the composition. The use of symmetrical layout, flags on both sides and moire decoration on the bottom form a balanced visual effect, making the picture stable and harmonious. The banner, combined with the smoke above, extends the horizontal lines of the picture and enhances the sense of width of the composition. The lines of the figures and incense burner are relatively straight and hard, which contrasts with the soft smoke, producing a visual effect of soft and hard. The spiral shape of the moire at the bottom echoes the curve of the smoke, adding rhythm and fluidity. The figure and the incense burner in front are visually located in the front layer, which is the main layer of the composition. The flags, as a secondary element, are in the middle layer, playing a role

of transition and foil. The smoke and moire behind the background layer add background information and atmosphere to the subject. Through the rendering of smoke and the arrangement of moire, a sense of open space is formed, and the figures seem to be in a vast ceremonial space. In the design manuscript, static elements (such as figures, incense burners, flags) are combined with dynamic elements (such as smoke, moire) to create a vivid and stable scene. The motifs and decorations on the flags in the figure not only increase the overall decoration, but also may contain some symbolic meaning, such as auspicious clouds symbolize luck, and the patterns on the flags may be a mascot or logo. Through the traditional clothing, incense burner design and the Chinese characters on the banner, the integration of these cultural elements makes the whole painting full of strong cultural atmosphere.

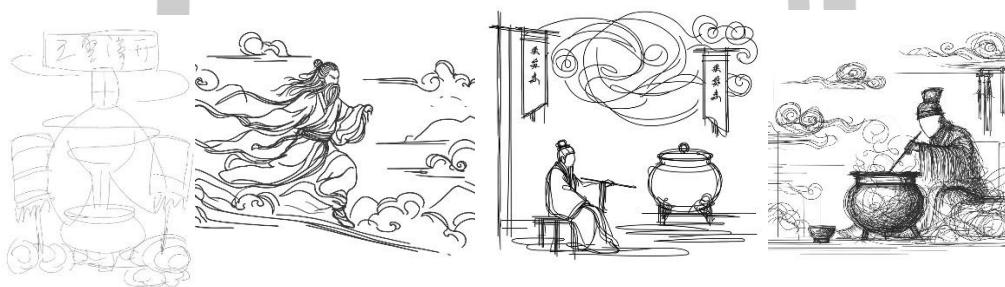


Figure 220 Chen Yuanguang sacrificial ceremony paper-cut works design sketch

source: Cui BaoLi 2023

Zhangzhou puppet art, especially the puppet head carving, is an important part of Fujian's cultural heritage, with a history dating back more than a thousand years. This complex craft involved carving not only the head, but also the limbs, costumes and headdresses of the puppets. The heads of these puppets are particularly striking for their lively and lively expressions, which are often exaggerated to convey the emotional intensity of the performance. These well-crafted puppets become animated storytellers on stage, their exaggerated facial expressions bringing stories and characters to life in a way unique to this traditional art form. Zhangzhou puppetry is not just about carving; It is a comprehensive theatrical form that combines music, storytelling, and puppeteering. Traditionally, these roles fall into categories common to Chinese opera: Dan (female), Sheng (male), Jing (colored face), and Zhou (clown). Founded in the 1950s, the Zhangzhou Puppet Troupe has been the guardian of this art form, winning international recognition for its performances and promoting the spread of art through film and television. The performances, a way to protect intangible cultural heritage, have won Zhangzhou puppetry praise on the domestic and international stage. The process of creating puppets is often a family tradition, passed down from generation to generation, preserving not only the technique but also the cultural story and meaning behind each performance. Master craftsmen like Xu Zhuchu have played a key role in the development of the craft, combining traditional methods with individual innovations to create a unique style that has gained worldwide recognition and acclaim. For anyone interested in the depth and beauty of traditional Chinese art, Zhangzhou puppetry offers a rich cultural heritage that reflects the history of the region as well as broader Chinese art and stories.

In this design, the puppet is the main focus, occupying the center of the picture with the puppet. This brings the audience's attention directly to the action of the

puppet show. The puppeteers on both sides frame the action, adding a layer of human interaction and context to the scene, showing the artistry behind the puppet show. The banners and vertical poles of the puppet stage create strong vertical lines that give the composition a sense of height and grandeur, which complements the dramatic aspect of the subject. The inclusion of Chinese characters on banners and stage backgrounds provides the particularity of the background and culture. The background reads "Zhangzhou Puppet Show" (Zhangzhou Puppet Show), fixing the image in its cultural and geographical context. The images are balanced with equal visual weight on both sides of the central puppet figure. This symmetry is common in traditional Asian art and provides a sense of harmony and order. The lines are very detailed, especially around the puppet figures, and intricate, requiring careful and deliberate depiction of their gorgeous costumes and expressions. The puppets' exaggerated facial expressions and dynamic poses suggest movement and drama, which are essential to convey the vividness of the puppet show. There is a textural contrast between the soft, fluid lines used for curtains and banners and the more detailed, intricate lines used for puppet costumes and facial features. The intricate design of the puppet costumes and Chinese characters is symbolic, a reference to the story told and the tradition of Zhangzhou puppet shows. A direct view is a typical feature of a design that can be used as a poster or program cover, and represents the scene clearly and directly. Puppets are stylized representations that do not aim for realism, but rather capture the essence of the figures they represent in the art of puppetry.



Figure 221 Zhangzhou puppet show paper-cut works design sketch
source: Cui BaoLi 2023

Zhangzhou puppet show paper-cut works design sketch. The park is a comprehensive cultural rest park with water system as the main landscape, with the art of ancient Chinese gardens, and various scenic spots with pavilions, pavilions, corridors, Bridges and other architectural pieces. Zhangpu West Lake has a long history, founded in the eighth year of Jiading in the Southern Song Dynasty (AD 1215), where the south of the Lushui River, the distance is winding tens of miles of Liangyue group peaks, distant mountains near the water, picturesque, "Lake Ying" is one of the ten sights of Zhangpu. In 1995, in order to build the historical spot into a modern famous park, according to the corner of the lake, the park was designed by Professor Peng Yigang of Tianjin University, a member of the CPPCC National Committee, academician of the Chinese Academy of Sciences, and Professor Qigong of Beijing Normal University for the horizontal plaque of the West Lake Park. As an important leisure spot in Zhangpu County, West Lake Park not only provides a good place for local residents to relax and entertain, but also attracts many tourists to visit.

When designing this paper cut, we considered the building as the main object of expression. We chose the pavilion at the top as the main focus, drawing the eye upward, which is emphasized by the convergence line of the bridge structure. The composition utilizes the common characteristic symmetry of traditional Chinese

architecture to create balance and harmony in the design. The arch of the bridge adds depth to the composition, directing the viewer's gaze into the image. Overlapping waves in the foreground further enhance the sense of dimensionality. Stylized clouds in the upper left add asymmetrical elements, providing a sense of movement and contrast to an otherwise symmetrical composition. The Chinese characters at the top are the name of the park, adding to the cultural particularity of the scene. The exquisitely designed roof of the pavilion with multiple eaves highlights its status or importance in Chinese architecture. The brick and wave patterns of the bridge are rendered into textures that distinguish these elements from the smooth surface of the pavilion columns and roof. The use of negative Spaces, especially in areas representing water, contrasts with the detailed lines of Bridges and pavilions, adding visual interest and highlighting structural elements. The overall design resonates with traditional Chinese art styles, often featuring detailed lines, natural elements and architectural features.



Figure 222 Zhangzhou West Lake Park paper-cut design sketch
source: Cui BaoLi 2023

Mazu Temple is a sea god widely worshipped in China's coastal areas, especially in Fujian and Taiwan, and is regarded as a god to protect the safety of navigation and the well-being of fishermen. As an important local religious and cultural center, Wushi Mazu Temple carries profound religious beliefs and local cultural characteristics. When the work was conceived, Mazu was placed in a central position, which made her the main theme and focus of the artwork. Her vertical stance also adds to the sense of height and prominence within the picture. The waves at the bottom create a dynamic basis for the composition, suggesting the power and grace of the sea, which is the domain of Mazu. The flowing lines and clouds of the robe give a sense of movement and fluidity. Although waves and clouds suggest movement, the composition is balanced. Mazu's serene and stable posture contrasts with the movement, creating a harmonious overall effect. The inclusion of fishing boats in the background adds depth to the composition and places Mazu in the Marine culture she protects. The use of clean, uninterrupted lines to make graphics and other elements clear is typical of line drawings and can be used for further applications, such as picture books or prints. Stylized cloud waves follow traditional Chinese aesthetics, and these elements are often represented in rhythmic, fluid lines, similar to patterns in Chinese silk paintings. The presence of Mazu and the ship suggests a cultural or spiritual theme, suggesting narratives related to her mythological story and her role as protector of seafarers. Mazu's headwear, clothing and facial features are intricately designed in detail, adding visual interest and indicating her status and divinity. The

design effectively uses traditional Chinese art motifs and depictions of deities to convey a sense of protection and reverence for the ocean. It can be used for educational or decorative purposes, highlighting cultural heritage and religious beliefs.



Figure 223 Wushi Mazu Temple paper-cut works design draft
source: Cui BaoLi 2023

Gulei Coastal scenic tourism area, Gulei coastal scenic tourism area is located in Zhangpu County Gulei Peninsula east of the Caiyu islands. Shazhou, Hongyu, Jing 'an, Balu Island, Caiyu, Hengyu and other twenty-three islands of different sizes from the west to the east, the sea and sky vast, rocky cliffs, from a distance, like floating on the green clouds Pengcai Xianshan. So when designing this piece, the image takes the sea and the boat as the foreground, the rock formation as the middle ground, and the background is the mountain with the structure at the top to create depth. The horizontal lines of the sea bring a sense of calm and stability to the composition, balanced with the verticality of the mountains, drawing the eye upwards. Images with multiple points of interest, such as ships and mountains with structures, create a narrative about location and activity within the scene. Clean and clean lines create a peaceful environment. The different thicknesses of the lines add a subtle dimension. The use of minimalistic details gives the artwork a serene and timeless quality that is often sought after in traditional Chinese art. The full use of negative space, especially in the sky, contributes to the overall tranquility, allowing the viewer's imagination to fill in the details. The clouds are stylized, a typical Chinese landscape, adding a touch of whimsy and movement to an otherwise peaceful scene.

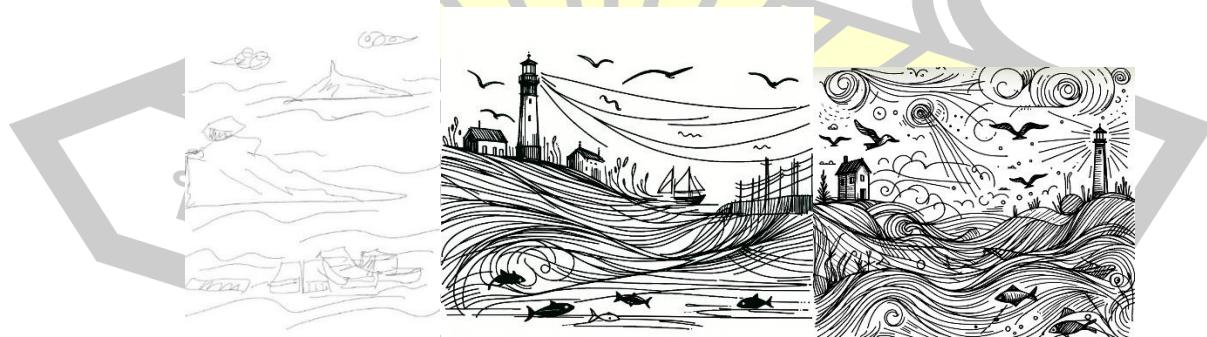


Figure 224 Gulei coastal scenic tourism area paper-cut works design draft
source: Cui BaoLi 2023

5.3 Feedback adjustments

In the process of designing paper-cut patterns, receiving feedback from experts and adjusting the design sketch accordingly is an extremely critical step. This link acts as a bridge in the overall design process, connecting every detail of the initial concept to the final realization. Feedback from experts, often based on their deep expertise and extensive practical experience, is crucial to improving the quality of the design, ensuring the feasibility of the technology, and enhancing the depth of artistic expression. The art of paper cutting is an art form that requires great precision and technical proficiency. Expert feedback can point out technical deficiencies in the design, such as the difficulty of cutting, the choice of paper, the structural stability of the pattern, and the practicality of the design. These professional instructions help designers fine-tune and refine their sketches, ensuring that the final paper-cut work is not only visually beautiful, but also structurally solid and meets the needs of the actual operation. In addition, experts are often able to provide insight into artistic styles, creative expression, and cultural elements. Their feedback can stimulate creativity, push designers to explore new creative directions, and guide the development of the work in a more unique and expressive direction. Incorporating new artistic elements into the design, exploring different color and texture combinations, or trying different paper cutting techniques may be inspired by some tips from experts. Especially in the design of paper cuts involving specific cultural or historical themes, the feedback of experts is particularly important. They can ensure that the design not only reflects accurate cultural information and historical context, but is also more precise and sensitive in conveying this information. Such a design not only enhances the educational value and cultural depth of the work, but also enables the viewer to more deeply understand and appreciate the story and meaning behind the work of art. Experts also often have a deep understanding of market trends and audience preferences. Their feedback can help designers adapt their designs to better suit market needs and appeal to their target audience. In the competitive arts and crafts market, designers who are able to respond quickly to market changes and audience expectations are often more successful. Through expert feedback, designers are not only able to improve their current work, but also gain a significant increase in their skills and knowledge. This kind of professional guidance and advice is a rare learning opportunity for designers in their artistic career, helping them to develop both theoretical knowledge and practical skills. In general, getting feedback from experts and adjusting design sketches accordingly is an extremely important opportunity for decoupage designers to learn and grow. It not only improves the quality of current works, but also provides designers with valuable artistic and technical guidance to help them reach new heights in the field of paper-cut art. Through this professional interaction and feedback, designers are able to take their work to the next level, not only more technically exquisite, but also more profound and powerful in artistic expression. This integrated growth is not only reflected in individual pieces, but also has a profound impact on the designer's entire career.

5.4 Refine the design

After determining the basic concept, move on to more elaborate design work. This includes drawing each element in detail, ensuring that they are both artistically and culturally representative and appealing. During this stage, the designer may make several changes to achieve the best visual effects and cultural expression.

In the process of designing paper-cut patterns, the importance of detailed design and adjustment stage cannot be underestimated. This stage is a key step in the transformation of initial ideas and sketches into detailed, mature design work, and is a turning point in the entire design process, marking the transition from concept to actual creation. At this stage, designers not only have to precisely express their creative intent, but also need to ensure that every detail fits into predetermined visual and emotional goals. In the art of paper cutting, small changes in details can have a major impact on the feel and expression of the overall piece. For example, the thickness of the lines, the change in Angle, and the spatial distribution between patterns can greatly affect the final appearance and perception of the work. The production of paper-cut works requires a high degree of precision. During the elaboration phase, the designer must ensure that every cut line and shape is accurate and implementable. This stage takes into account the texture and strength of the paper, as well as the limitations of the shearing process, to ensure that the design is both beautiful and practical. For complex paper-cut designs, this stage may involve the processing of hundreds or even thousands of small details, requiring the designer to have extremely high patience and attention to detail. The detailed design stage is the process of optimizing the visual effects of the work. This includes adjusting the proportion, symmetry and overall layout of the pattern to enhance visual appeal. Designers may experiment with different color combinations (if using colored paper) or texture effects at this stage to achieve the best visual effect. For example, a designer may enhance visual depth and dynamics by changing the contrast of light and shade or color gradients in a pattern. In some cases, paper-cut works are not just works of art, but may also have a practical function, such as window coverings or decorations. During the elaboration phase, designers need to ensure that the work is not only aesthetically pleasing, but also meets its functional requirements. This may mean finding a balance between aesthetics and practicality, for example, making sure the design is stable enough to resist the wind, or choosing materials suitable for long-term display. Designers may make design adjustments based on customer feedback or changes in project requirements. Flexibility at this stage is essential to meet the needs of end users. With subtle adjustments to the design, it is possible to better adapt to the expectations of the target market or specific audience. This process may involve ongoing communication with the client to ensure that the design meets their specific requirements and tastes. Refining the design phase is an opportunity to give the work a unique and individual character. Designers can add a unique personal style or symbol at this stage to make the work different. This can be done by adding specific cultural elements, personal memories, or symbolic motifs to add deeper meaning and personal connection to the work. Overall, the detailed design and adjustment stage is essential to ensure the artistry, technical integrity, visual appeal and practicality of paper-cut works. It is the bridge between the initial idea and the finished product, ensuring that the final product accurately reflects the designer's creativity and meets

the actual needs. Through careful refinement and adjustment, paper-cut art works can reach a higher artistic level, but also reflects the designer's attention to details and mastery of the craft. This stage is a process of carefully examining and perfecting the idea, which requires the designer to have a high degree of concentration and a deep understanding of the art of paper cutting. Through this stage of efforts, paper-cut works will not only be visually attractive, but also move people's hearts technically and emotionally.

Chen Yuanguang sacrificial ceremony, starting from the main shape of the sketch. Make sure the proportions and perspective are correct. Gradually refine the lines and shapes. The design of the shape is not imaginary, but a reference to the relevant field survey data for reference design. The portrait of Chen Yuanguang in the design drawing draws on the existing portrait of Chen Yuanguang himself. The plaque in the design draft and the font on it all refer to the plaque of Chen Yuanguang Temple, and the incense burner in front of the design draft refers to the representative incense burner of Chen Yuanguang Park. The flags on both sides of the design draft refer to the shape of the flags in the sacrificial ceremony of Chen Yuanguang. The difficulty of design lies in how to combine many elements together reasonably, and unify the composition rhythm and picture hierarchy. The auspicious cloud pattern in the design draft is the representative auspicious cloud pattern in China, which not only implies auspicious meaning in the work, but also connects the elements in the picture together to form a whole, playing a very important role. The complete design work is presented. Design reference and design refinement effects are shown in the figure.

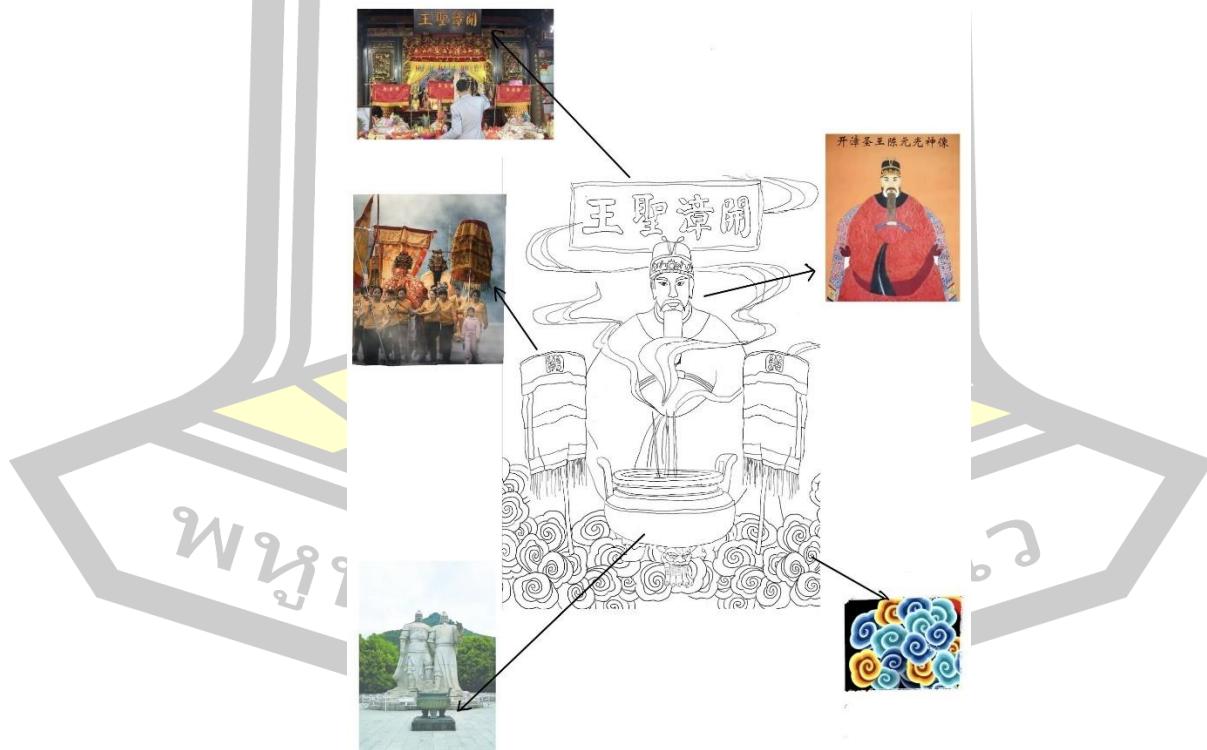


Figure 225 Chen Yuanguang sacrificial ceremony paper-cut works design reference
source: Cui BaoLi 2023



Figure 226 Chen Yuanguang sacrificial ceremony paper-cut works design detailed renderings

source: Cui BaoLi 2023

Zhangzhou puppet art, like Zhangpu paper cutting, belongs to a traditional folk art. Puppet art focuses on performance. An art form of entertainment and education. The focus should be on highlighting its performance effect, so when designing paper-cut works, the background is mainly performed on the stage, as if performing on the stage, giving the audience a feeling of being in the scene. Also, some real materials were used in the design. For example, the stage design was based on the real stage of the traditional folk puppet show in Zhangpu. Among them, the puppets are mainly shaped by dramatic characters, which is also the most common and popular theme of puppet show. In the design of the puppet character's headgear and clothing, the real puppet shape is also referenced, and the real restoration is pursued. The artist who manipulates the puppet show refers to the movements and expressions of the master performers, and a vivid and real feeling is presented to the work. The reference diagram and design detail diagram are shown in the figure.



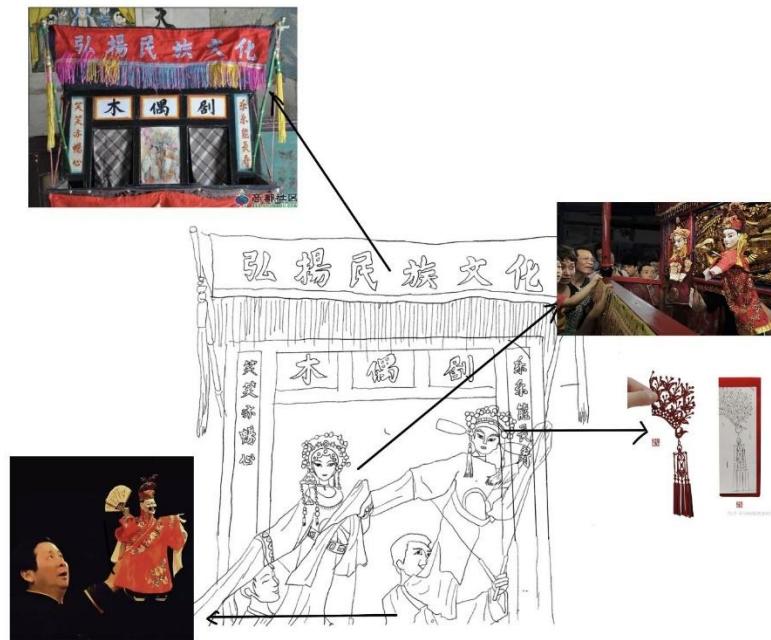


Figure 227 Zhangzhou puppet art paper-cut works design reference
source: Cui BaoLi 2023



Figure 228 Zhangzhou puppet art design detail map
source: Cui BaoLi 2023

Zhangzhou West Lake Park, one of the famous tourist attractions in Zhangzhou, is located in Zhangpu County. The representative culture of a park lies in its architecture. The design work mainly presents a representative arch bridge building. Stylized clouds and waves through line drawings are typical features of traditional Chinese art. These elements add a cultural and stylistic narrative to the design. The detailed lines of the bridge and their reflections suggest a focus on the interaction between the structure and its environment, a key aspect of landscape design. The design incorporates a variety of elements - actual structure, environment and cultural themes - to create a comprehensive visual guide for the intended project. Design reference and design refinement are shown in the figure:



Figure 229 Zhangzhou West Lake paper-cut works design reference
source: Cui BaoLi 2023



Figure 230 Zhangzhou West Lake paper-cut works design detailed map
source: Cui BaoLi 2023

The belief in Mazu embodies the characteristics of ancient Chinese maritime culture, especially for fishermen and crew, Mazu is a god to protect their safe sea and smooth return. Mazu temples are all over the coastal areas and have become part of the local culture, and there are grand celebrations on Mazu's birthday and other festivals every year, attracting many believers and tourists. Therefore, in the design of Mazu paper-cut works, the designer focuses on the design of the image of Mazu from the perspective of faith and reverence, and deliberately does not add too many architectural elements, but simply describes Mazu standing on the waves with lines surrounded by clouds and birds, showing a sacred and solemn atmosphere. Mazu's clothing is rich in details, wearing a crown on the head and holding a ritual instrument, which is dignified and mysterious. All the works highlight the core position of Mazu.

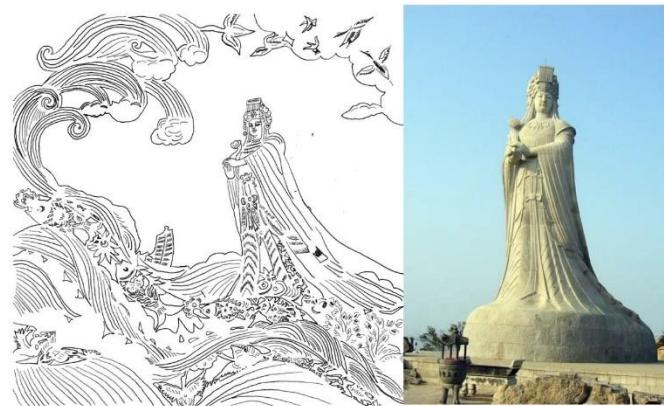


Figure 231 Wushi Mazu Temple paper-cut works reference
source: Cui BaoLi 2023



Figure 232 Wushi Mazu Temple paper-cut works design detailed map
source: Cui BaoLi 2023

In the design of this work, the image takes the sea and ships as the foreground, the rock formation as the middle zone, and the background is the mountain with a structure on the top to create depth. The horizontal lines of the sea bring a sense of calm and stability to the composition, balanced with the verticality of the mountains, drawing the eye upwards. Images with multiple points of interest, such as ships and mountains with structures, create a narrative about location and activity within the scene. Because it is a scenic paper-cut work, the main content is the natural landscape, and it has done important processing at the near and far level to highlight the sense of space. Reference was made to the material on the ground. Reference material and design refinement figure.

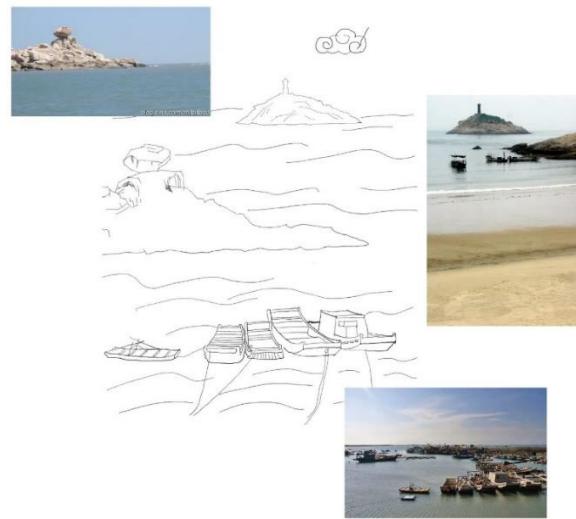


Figure 233 Gulei coastal scenic tourism area paper-cut works reference
source: Cui BaoLi 2023

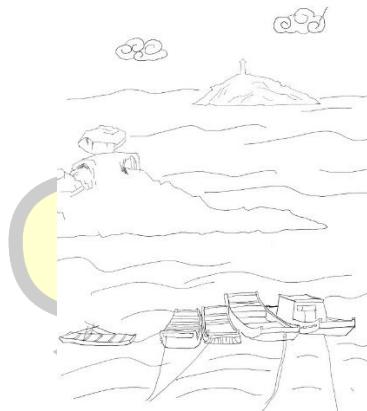


Figure 234 Gulei coastal scenic tourism area paper-cut works design detailed map
source: Cui BaoLi 2023

During the design process, we have completed five detailed designs of Kaizhang Sacred King Sacrifice Ceremony, Zhangpu puppet art, West Lake Park, Wushi Mazu Temple, and Gulei Coastal Scenic Area. These works not only capture the solemn deity representing the image of community assets, but also show the profound significance of community assets in culture. Next, we will use the traditional Zhangpu paper-cutting craft to transform these designs into unique paper-cutting artworks. Paper-cutting, this ancient art form, with its exquisite delicacy and profound cultural connotation, provides us with a perfect medium to express these works. Through paper cutting, we turn the lines and forms in the design draft into reality, further enriching our understanding and expression of Zhangpu cultural inheritance.

5.5 Paper-cut production

Tracing

The designed pattern is adjusted according to the actual size of the paper. Due to the size of the paper we make, the size of the pattern needs to be adjusted appropriately according to the details of the pattern and the characteristics of the paper. After the adjustment, draw the design pattern onto the scratch paper. In the process of painting and cutting the pattern can be adjusted according to its specific environment, which is allowed. After drawing, the scratch paper and the made paper are bound together to prepare for cutting.

clipping

In order to ensure the accuracy of the image and paper, the previous step has used a stapler to accurately staple the book and firmly fix it around the backing plate. The sculpture of the character should first be concentrated in the five-point area, while the scenery should be finely carved first, and then start from the center and gradually depict in all directions. The order of the knives is like writing, from top to bottom, from left to right, from small to large, from fine to coarse, from part to whole. As far as possible, do not use duplicate knives, those unnecessary parts must be cut off, avoid tearing with your hands, because doing so may cause the paper cut to have rough edges, thus affecting its appearance. Local paper-cutting artists in Zhangpu mainly use scissors as the main tool, and carving knives as the auxiliary tool. When cutting works, Yang cut is also the main and Yin cut is the auxiliary. We combine the advantages of scissors and knives while using both tools. Ensure the smooth production of the work. Start cutting according to our stapled design. Whether it is scissors or carving knives, it needs to be a process from inside out, from complex to simple. You need patience in the process of cutting. Keep steady. Don't rush.

Edit

In the process of cutting, it is easy to have some mistakes or imperfections, so it needs to be revised. In the process of cutting, especially when cutting paper, sometimes the cutting will be damaged. If it is a large area of damage, it will be more difficult to repair, but if it is a small area of damage, it can be partially cut out and re-carved a piece. When modifying, be sure to do the number in mind and then the knife.

Peel off

After modification, it is uncovered, and after finishing cutting, it is necessary to uncover the paper cutting one by one. Paper such as electrogloss and suede paper is relatively easy to lift because of its smoothness. And single rice paper and powdered paper because of its thin texture, and after damp and color treatment, it is easy to produce adhesion, resulting in difficulty in lifting. Therefore, before unveiling, it is necessary to gently rub the already carved cardboard to separate it. Then, gently lift the corner of the first piece of paper and blow with your mouth as you lift it to aid the process.

Mount (a picture)

Mounting, paper-cut works after the completion of the finished products need to be pasted together to facilitate its long-term preservation. There are two different methods, the first is to lay paper-cut flat on the paper, and then use a brush or a thin wooden strip dipped in paste, from inside to outside gradually stick, but this method can not completely stick paper-cut, and the speed is slower, its advantage is simple

operation. The second method is to spread the paper-cut horizontally on the paper, and then dip the pen into the diluted paste and gently apply it on the paper that needs to be supported, taking care to avoid wrinkles on the paper brush and ensuring that the amount of paste on the brush is small. Then, quickly put the pasted side on the back of the paper cut, and then gently press it flat with your hand to ensure that the paper cut is evenly adhered to the supporting paper, and then gently lift and dry, and then clip flat for preservation. In addition to using paste as an adhesive, white latex is also a viable option.

5.6 Paper-cut works display



Figure 235 Zhangzhou puppet show paper-cut works

source: Cui BaoLi 2023



Figure 236 Gulei seaside scenic spot paper-cut works

source: Cui BaoLi 2023

CHAPTER VI

Research Summary Discussion And Suggestions

6.1 Research Summary

The purpose of this study is to study the paper-cut art in Zhangpu County, Zhangzhou City, Fujian Province, China. Zhangpu paper-cut art is the representative of South China paper-cut art, which not only reflects the uniqueness of local culture, but also shows the artist's deep understanding and re-creation of the beauty of nature and life, providing a valuable perspective for the study of the culture of various regions in China. This study has the following three important objectives. 1. Research on Zhangpu community assets. 2. Study the papermaking materials and production process reflecting Zhangpu culture. 3. Create paper-cut works representing Zhangpu culture. This study adopts a mixed research method, including qualitative and quantitative research. The research data were collected mainly through fieldwork and literature research. Through the concept of humanities and social science, the main concepts include: community capital, local wisdom, cultural capital, innovation and so on. The results are presented in the form of descriptive analysis and participatory experiment. At the same time, the work is presented through the participatory creation in the participatory research method. The main research groups and samples include: 1. Paper cutting artisans in Zhangpu County, Fujian Province. 2. Staff of government departments related to culture and art in Zhangpu County, Fujian Province. 3. Local life of ordinary residents of Zhangpu County, Fujian Province. 4. Some relevant scholars who have studied paper cutting in Zhangpu, Fujian Province.

Community capital is regarded as a variety of resources, capabilities and strengths within a community that can be mobilized to improve community life and solve community problems. To be specific, These assets include, but are not limited to, physical assets (such as schools, parks, transportation facilities), human assets (such as residents' skills and knowledge), social assets (such as community groups and networks), cultural assets (such as local traditions and cultural heritage), economic assets (such as local businesses and employment opportunities), and natural assets (such as natural environments and green Spaces) (Kretzmann&McKnight,1993). According to the needs of the research, this research focuses on the intangible cultural assets, the scenic spots in the material cultural assets and the natural landscape in the natural assets of Zhangpu. From 26 community assets, in the form of questionnaire, finally selected 5 representative community assets of Zhangpu. Including, intangible cultural assets: Kaizhang Holy King sacrifice ceremony, Zhangpu puppet art two. Material and cultural assets: West Lake Park and Wushi Mazu Temple. Natural assets Gulei coastal scenic tourist area one. There are five items in total.

In the study of Zhangpu papermaking materials and production process, researchers collected common plant information in Zhangpu area through field investigation and questionnaire survey. Then the plants that can be used for papermaking were identified by referring to the literature. The plant information here is also the community capital of Zhangpu. The plants that can make paper are kelp, laver, pine, bamboo and mulberry. Through the questionnaire survey of residents in Zhangpu area, it is calculated that the sea belt, laver and bamboo are the most

representative areas. As a papermaking material, bamboo has a very long history and mature technology. Therefore, it is not used as the research object of this study. In this study, a variety of papermaking experiments, such as slicing, fermentation and steaming, were carried out by using laver and kelp as materials. Finally, it is concluded that the paper made of seaweed and kelp as raw materials is easy to damage due to poor toughness, and is not suitable for paper cutting. Then laver and kelp were combined with bamboo fiber to carry out the mixed material experiment, and 18 groups of small experiments were carried out according to different pulp mixing ratios. Through the examination of paper, it is concluded that the paper made by mixing seaweed and bamboo in 9:1 ratio is suitable for paper cutting creation. Paper performance is good, and there is a natural texture, can create a unique artistic effect.

From the color, texture, toughness of the three parameters that determine the applicability of paper-cutting as the standard, combined with the practical feedback of paper-cutting artists. Teacher Lu Shurong and Teacher Zeng Fangfang, the inheritors of provincial paper-cutting in Zhangpu County, were specially invited as participants in the experiment to conduct paper-cutting practical experiments with the standard of paper-cutting production. The paper made of new materials made of paper made of new materials was a sight to behold, and they gave a high degree of recognition and feedback on the experiments. Finally, it was determined that the mixed pulp experimental paper with laver fiber accounting for 90% and bamboo fiber accounting for 10% in the laver and bamboo mixed materials was the most suitable for paper-cutting. It can be used as Zhangpu paper-cut creative paper.

Compare the paper traditionally used with the paper made by the researchers. There are several differences and advantages. 1. Fiber strength and flexibility: Handmade paper has high fiber strength and flexibility, which is very important for the art of paper-cutting, because it requires the paper to be not easy to break when it is finely cut. 2. Texture and thickness: The texture and thickness of handmade paper are richer and more layered than traditional rice paper, and this texture may bring more visual effects and three-dimensional sense to the art of paper-cutting. 3. Ink absorption and color performance: Although rice paper is known for its ink absorption and soft paper, which is suitable for pen and ink arts such as Chinese painting, for paper-cutting, paper with mixed fibers of seaweed and bamboo may have better color performance and durability because of its unique materials and production processes. 4. Cultural significance: Handmade paper incorporates the local marine elements of Zhangpu, which is more in line with the needs of expressing the cultural identity of the region, while red rice paper is also a traditional Chinese high-quality paper, but it lacks the symbolic connection with the specific local culture of Zhangpu. Combined with the above analysis, handmade paper made of laver and bamboo mixed fibers is considered to be more suitable for the unique paper-cutting art in Zhangpu area due to its special physical characteristics and cultural symbolism.



Figure 237 Create paper-cut works that represent Zhangpu culture. Design and create paper-cut works of Zhangpu based on the paper studied by researchers and the representative community capital of Zhangpu. Zhangpu paper-cut emphasizes "Zhangzhang tangible, intentional", its core idea must be very clear. Researchers design and produce paper-cut works with five representative assets of Kaizhang Sacred King Sacrifice Ceremony, Zhangpu puppet art, West Lake Park, Wushi Mazu Temple and Gulei Coastal scenic and tourism area as materials and themes. Using the researchers hand-produced seaweed and bamboo mixed pulp paper. Create 5 distinctive themes, Zhangpu regional characteristics of the representative paper-cut works.

6.2 Discussion

6.2.1 The use of community capital

In contemporary society, the utilization of community capital will become an important way to promote local culture and economic development. Especially in the field of artistic creation, by exploiting and utilizing the natural resources, history, culture, cultural customs and other assets in the community, artists can create works with distinct regional characteristics, which not only inherits the local culture, but also promotes the sustainable development of the community. Taking this study as an example, by using the natural resources of Zhangpu community -- kelp, laver and bamboo, the paper cutting art works with local characteristics are created, which not only shows the unique natural scenery and cultural heritage of Zhangpu, but also injects new vitality into the development of community economy. The utilization of community capital is first reflected in the deep mining and innovative application of natural resources. Zhangpu County is rich in kelp and laver resources, which are not only important local cash crops, but also an important part of Zhangpu food culture. By transforming these natural resources into artistic materials, this research has created a new form of artistic expression, which not only allows people to visually re-understand and appreciate these everyday ingredients, but also enhances the added value of these natural resources and promotes the development of local specialty industries. In addition, the use of bamboo as a material for handmade paper not only reflects the respect and protection of traditional culture, but also demonstrates the concept of environmental protection and sustainable development, providing a new path for the inheritance and innovation of local bamboo culture. The use of community capital is also reflected in the protection and innovation of history and culture. Zhangpu is not only rich in natural resources, but also has a long history and culture and unique local customs. By studying the history and culture of Zhangpu, artists can gain an in-depth understanding of the local traditional art forms, folk customs and historical stories, which can become the source of inspiration for artistic

creation. For example, Zhangpu's Marine culture, fishing village life and other elements can be integrated into the paper-cut art, so that the work not only has visual beauty, but also carries rich cultural significance and story. This kind of artistic creation based on community assets not only helps to preserve and pass on local culture, but also attracts more attention and interest, and promotes the development of cultural tourism and related industries.

The utilization of community capital is a process of community participation and co-construction. In the process of creation, artists can conduct in-depth exchanges and cooperation with community residents to understand their lifestyle, aesthetic preferences and cultural needs, so as to make artistic works closer to the lives of community residents and enhance the social significance and practical value of works. At the same time, artistic creation activities can also become a platform to promote community cohesion and cultural confidence, stimulate community residents' pride and sense of belonging to local culture, and promote the harmonious development of the community. In short, through the in-depth study and innovative utilization of Zhangpu community capital, this study not only expands the expression form and connotation of paper cutting art, but also provides new ideas and practical cases for the cultural inheritance, economic development and social harmony of the community. This kind of artistic innovation based on community capital shows the great potential of combining traditional art with modern development, and provides beneficial reference and inspiration for cultural and artistic innovation and community development in other regions.

6.2.1 Cultural inheritance and innovation

In today's society, cultural inheritance and innovation is the key to promote the sustainable development of national culture. Especially in the protection and promotion of local culture, how to balance tradition and modernity, inheritance and innovation has become a major challenge for artists and cultural workers. Taking this study as an example, by combining Zhangpu's natural resources with paper-cutting art, it not only successfully inherits local culture, but also injects new vitality into it, showing the possibility of cultural inheritance and innovation.

First of all, the core of cultural inheritance lies in protecting and inheriting the basic spirit and skills of traditional art. In Zhangpu, paper-cut art is a long traditional cultural form, carrying rich local history and folk information. Through the study and practice of traditional paper-cutting techniques, artists can deeply understand the cultural significance behind it and ensure that the essence of traditional art is not lost in the process of innovation. For example, Zhangpu paper-cut art reflects respect for and inheritance of traditional culture in terms of material selection and design theme, such as the use of local unique plant materials (kelp, seaweed, bamboo) to make paper, which not only retains the traditional characteristics of paper-cut art, but also shows respect for and utilization of local natural environment. Secondly, cultural innovation is an indispensable part of the heritage, which requires artists to explore new forms of expression and themes in combination with contemporary aesthetics and technology on the basis of retaining the essence of tradition. In this study, the artist is not limited to traditional paper-cut techniques and themes, but integrates Zhangpu's natural landscape, social life and cultural characteristics into his paper-cut works, such as describing Zhangpu's Marine scenery and fishing village life through paper-cut. These works not only show Zhangpu's unique regional culture, but also have a

strong sense of modernity and innovation. In this way, the art of paper-cutting has not only become a bridge between the past and the present, but also a window to show the new look of Zhangpu culture. Finally, cultural inheritance and innovation also need the support and participation of all sectors of society. In Zhangpu, local governments, educational institutions, cultural organizations and community residents all play an important role in the inheritance and innovation of paper cutting art. For example, by holding paper-cutting art exhibitions, workshops and competitions, it not only provides a platform for artists to display their creations, but also allows more members of the public to participate in the learning and inheritance of traditional culture. This mode of multi-participation not only helps to enhance the public's understanding and interest in traditional culture, but also provides a broader social basis for cultural inheritance and innovation.

6.2.1 Development and application of environmentally friendly materials

In the context of the severe environmental challenges facing the world, the development and application of environmentally friendly materials has become an indispensable part of the sustainable development strategy. In the field of art in particular, the use of sustainable resources not only reduces the environmental impact of artistic creation, but also provides artists with new sources of inspiration and promotes innovation in art forms. Taking this study as an example, by using local natural resources such as kelp, laver and bamboo in Zhangpu as raw materials for handmade paper, it not only shows respect for and protection of local ecological environment, but also provides new possibilities for the innovation of paper-cutting art.

First of all, in terms of the selection of environmentally friendly materials, kelp, laver and bamboo are all renewable resources, which have a short growth cycle, strong adaptability to the environment, and little damage to the ecosystem in the process of harvesting. Compared with traditional papermaking raw materials, the use of these plant raw materials greatly reduces the dependence on forest resources, helps to protect natural forests, and slows down the degradation of the ecological environment. In addition, these plants require less energy and chemical additives during processing, further reducing the negative environmental impact of artistic creation.

Secondly, in the process of artistic creation, the use of environmentally friendly materials is not only limited to reducing environmental impact, but also helps to enhance the cultural and artistic value of artistic works. For example, the paper made using kelp and laver not only has a unique texture, but also has a slight smell of the sea, which adds a new sensory experience to the art of paper cutting, making the work more vivid and expressive. At the same time, the use of this material also reflects the artist's deep understanding and respect for the local culture and natural environment, which makes the work have deeper cultural connotation and social significance.

In addition, the development and application of environmentally friendly materials also promotes cross-border cooperation in the field of art. To make better use of these native plant resources, artists need to collaborate with environmental scientists, materials engineers and other professionals to explore sustainable ways to use plant resources and innovative processing technologies. This cross-field cooperation not only helps to improve the efficiency of resource utilization, but also

promotes the application of new materials and new technologies in artistic creation and opens up a new path of artistic innovation.

Finally, the promotion and application of environmentally friendly materials also helps to raise public awareness of environmental protection and sustainable development. Through exhibitions, workshops and other forms, artists can show the public the application of environmentally friendly materials in artistic creation and the positive significance of this practice for environmental protection. This will not only stimulate public interest and support for environmental art, but also lead to broader discussion and practice of sustainable lifestyles in society.

In short, the development and application of environmentally friendly materials show great potential and value in artistic creation. Through the innovative use of these materials, artists can not only create works with unique charm while protecting the environment, but also promote the deep integration of art and technology, culture and environmental protection, contributing to the power of art for sustainable development.

6.3 Suggestions

6.3.1 Strengthen the study of local culture and art.

In order to better inherit and develop local culture, it is necessary to conduct in-depth research on it first. This includes not only the study of traditional art forms and techniques, but also local history, folk customs, natural environment and other aspects. Through comprehensive and in-depth research, the uniqueness and value of local culture can be revealed, providing rich materials and inspiration for artistic creation. For example, the paper cutting art of Zhangpu can be combined with the local Marine culture, farming culture and other characteristics to develop new works with local characteristics. In addition, the study of local culture should also pay attention to its application and development in contemporary society, and explore how to integrate traditional culture with modern life to make it more lively and close to people's life. To this end, it is recommended that local governments, educational institutions and cultural organizations increase investment in local culture research, support interdisciplinary research projects, and encourage artists, scholars and community members to participate in the research and innovation of local culture. At the same time, it is also necessary to promote the exchange and sharing of local cultural research results by establishing cultural databases, publishing local cultural research results and holding academic seminars.

6.3.2 Promote the use of environmentally friendly art materials

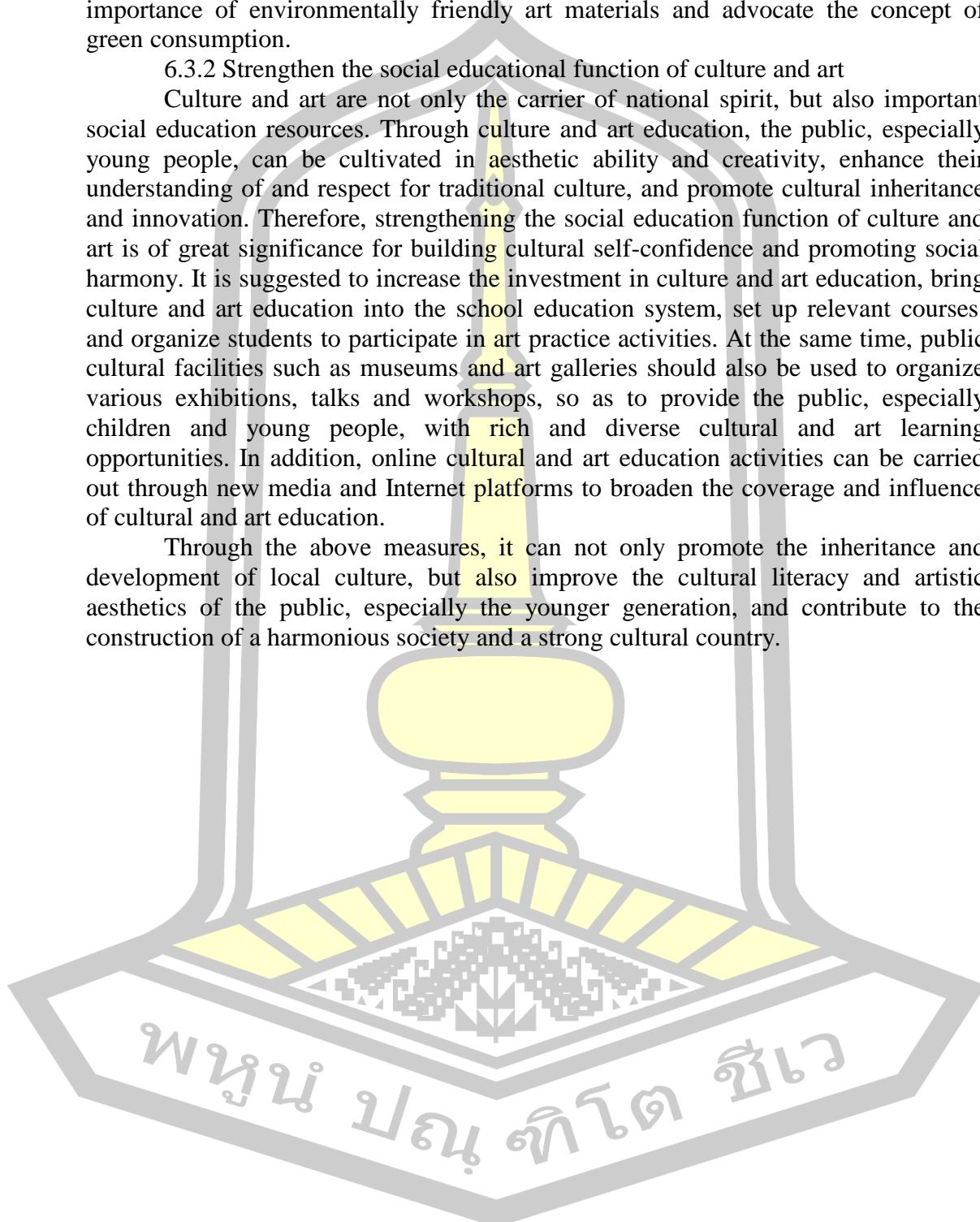
Facing the challenge of global environmental change, it is particularly important to promote the use of environmentally friendly art materials. This not only helps to reduce the impact of artistic creation on the natural environment, but is also a positive response of the art community to the concept of sustainable development. In this process, artists and designers should be encouraged to explore and use local renewable resources and develop new artistic materials and creative techniques. For example, paints, paper and other art supplies made from waste materials or sustainable resources can not only reduce the burden on the environment, but also inspire new artistic ideas. In order to promote the use of environmentally friendly materials, it is recommended that local governments and relevant organizations provide policy and financial support to encourage enterprises and scientific research

institutions to carry out research and development of new materials. At the same time, art education and public publicity activities should also raise public awareness of the importance of environmentally friendly art materials and advocate the concept of green consumption.

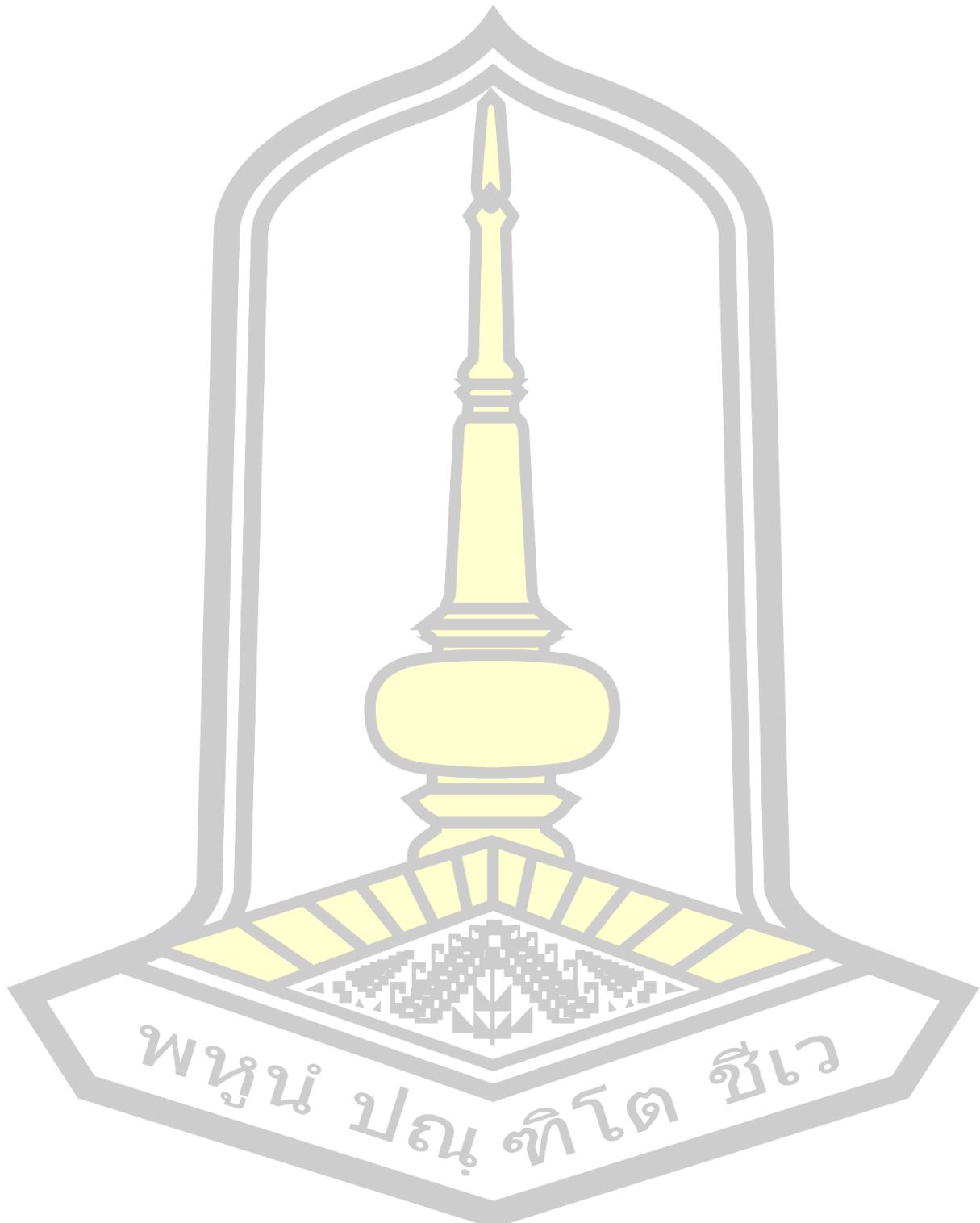
6.3.2 Strengthen the social educational function of culture and art

Culture and art are not only the carrier of national spirit, but also important social education resources. Through culture and art education, the public, especially young people, can be cultivated in aesthetic ability and creativity, enhance their understanding of and respect for traditional culture, and promote cultural inheritance and innovation. Therefore, strengthening the social education function of culture and art is of great significance for building cultural self-confidence and promoting social harmony. It is suggested to increase the investment in culture and art education, bring culture and art education into the school education system, set up relevant courses, and organize students to participate in art practice activities. At the same time, public cultural facilities such as museums and art galleries should also be used to organize various exhibitions, talks and workshops, so as to provide the public, especially children and young people, with rich and diverse cultural and art learning opportunities. In addition, online cultural and art education activities can be carried out through new media and Internet platforms to broaden the coverage and influence of cultural and art education.

Through the above measures, it can not only promote the inheritance and development of local culture, but also improve the cultural literacy and artistic aesthetics of the public, especially the younger generation, and contribute to the construction of a harmonious society and a strong cultural country.



REFERENCES



Ahlee, Kittitornkool, Thungwa & Parinyasutinun, 2014. Bang Kad: A Reflection Of Local Wisdom To Find Wild Honey And Ecological Use Of Resources In Melalaucu Forest In The Songkhla Lake Basin. Silpakorn University Journal of Social Sciences, Humanities, and Arts Vol.14(3) : 77 99, 2014 .

Chen, Y. (2018). The Art of Paper Cutting in Fujian Province. *Journal of Chinese Folklore Studies*, 29(4), 112-119.

Chen, Y., & Wang, H. (2021). Sustainable papermaking: An overview of non-conventional wood sources. *Journal of Industrial Ecology*, 25(3), 658-672.

Choi, S., & Han, G. (2019). Alkali treatment of seaweed for papermaking. *BioResources*, 14(2), 4561-4572.

Collection and Research Committee of Cultural and Historical Data of the CPPCC Zhangpu County, Fujian Province. (2004). *Annals of Zhangpu County*, Zhangpu: Jinpu News Development Company, 56.

Duan L P. (2005). Research on the development of paper cutting art in Zhangpu, Fujian Province. Fujian Yanhuang Cultural Research Association, Zhangzhou CPPCC.(eds.) *On Southern Fujian Culture: Proceedings of the Third Symposium on Southern Fujian Culture (Part 2)* (pp.5-17). Lujiang Publishing House (Lujiang Publishing House).

Ferguson, J. (1994). *The anti-politics machine: "Development," depoliticization, and bureaucratic power in Lesotho*. University of Minnesota Press.

Geertz, C. (1983). *Local knowledge: Further essays in interpretive anthropology*. Basic Books.

Giddens, A. (1990). *The consequences of modernity*. Stanford University Press.

Hu Jin.(2019). The application of Zhangpu folk paper-cut art in modern public art design. *Famous Works* (04), 78-79.

Huang, J. (2021). Innovation in Tradition: Case Studies of Modern Paper Cutting Art in Zhangpu, Fujian. *Journal of Modern Arts*, 39(3), 76-84.

Habermas, J. (1981). *The theory of communicative action, volume one: Reason and the rationalization of society*. Beacon Press.

Kim, J., & Park, S. (2019). Seaweed as a sustainable source for paper production. *Journal of Cleaner Production*, 217, 62-69.

Kim, J., & Park, S. (2020). Cellulose fibers from seaweed for papermaking: A sustainability perspective. *Journal of Sustainable Forestry*, 39(5), 473-487.

Kim, J., & Park, S. (2019). Sustainability of bamboo in paper production. *Journal of Cleaner Production*, 217, 62-69.

Kim, J., & Park, S. (2019). Sustainability of using pine in paper production. *Journal of Cleaner Production*, 217, 62-69.

Lin ShuYu. (2016). Research on paper cutting art in Zhangpu. *Journal of Chongqing Electronic Engineering Vocational College* (05),115-118.

Liu Li. (2021). Ethnic groups and Culture -- Marine civilization and the historical changes of Zhangpu paper-cutting. *Fujian and Taiwan Cultural Studies* (04), 72-78.

Liu Li. (2021). *Oral History of Zhangpu Paper-cut*. Beijing: Social Sciences Academic Press, 1-8.

Li, M., & Wang, H. (2020). Contemporary Trends in Traditional Chinese Paper Cutting. *Arts and Crafts Quarterly*, 45(2), 34-41.

Li, J. (2021). Precision in Paper Cutting Art from Zhangpu. *Journal of Traditional Crafts*, 18(3), 54-60.

Lee, J., Kim, H., & Park, J. (2018). Environmental impact assessment of seaweed-based paper production. *Journal of Environmental Management*, 215, 123-130.

Lee, J., & Park, S. (2020). Technical challenges in utilizing non-conventional plant fibers for papermaking. *Journal of Cleaner Production*, 245, 118722.

Makalah Disampaikan pada Seminar Nasional FPMIPA IKIP MATARAM 2014. Makalah Prosiding hal.xv –xxiv.

Ma Qianli.(2017). Zhangpu paper-cutting inheritance from the perspective of community participation. *Journal of Xuzhou Institute of Technology (Social Science Edition)*(02),9-13.

Muslimin, 2014. Inovasi Pembelajaran Sains Berbasis Kearifan Lokal.

Patel, S., & Kim, D. (2018). Environmental considerations in papermaking from non-traditional sources. *Resources, Conservation and Recycling*, 132, 112-120.

Patel, S., & Kim, D. (2018). Environmental impact of paper production from wood. *Resources, Conservation and Recycling*, 132, 112-120.

Patel, S., & Kim, D. (2018). Economic aspects of using pine for pulp and paper production. *Resources, Conservation and Recycling*, 132, 112-120.

Rogers, E. M. (2003). *Diffusion of innovations* (5th ed.). Free Press.

Schumpeter, J. A. (1934). *The theory of economic development: An inquiry into profits, capital, credit, interest, and the business cycle*. Transaction Publishers.

Smith, J., & Zhang, L. (2019). Fiber characteristics of non-wood plants for papermaking. *BioResources*, 14(3), 6543-6554.

Smith, J., & Zhang, L. (2019). Wood fibers for papermaking. *BioResources*, 14(3), 6543-6554.

Smith, J., & Zhang, L. (2019). Fiber characteristics and papermaking potential of non-wood plants. *BioResources*, 14(3), 6543-6554.

Tong Youjun.(2019). Study on Folk Paper-cut Art of Zherong and Zhangpu in Fujian Province. Xiamen: China Textile Press, 73.

Wang, Y., & Chen, X. (2019). Detailing in Traditional Chinese Paper Cutting: A Case Study of Zhangpu Style. *Folk Art International*, 33(1), 89-95.

Wang, X., & Liu, Z. (2021). Antimicrobial properties of paper made from seaweed. *Industrial Crops and Products*, 162, 113128.

Wu Zhenhao.(2014). Analysis on local cultural characteristics of Zhangpu paper-cut auspicious patterns. *Popular Arts* (05),49+171.

Ye Min.(2014). A Preliminary study of Zhangpu paper-cut art. *Popular Literature and Art* (05),120-121.

Tinnaluck, 2004. *Modern Science And Native Knowledge: collaborative Process that opens New Perspective For PCST*. QUARK, Number 32 .

Zhang, Y., & Li, H. (2020). Properties and papermaking potential of bamboo fibers. *Industrial Crops and Products*, 143, 111916.

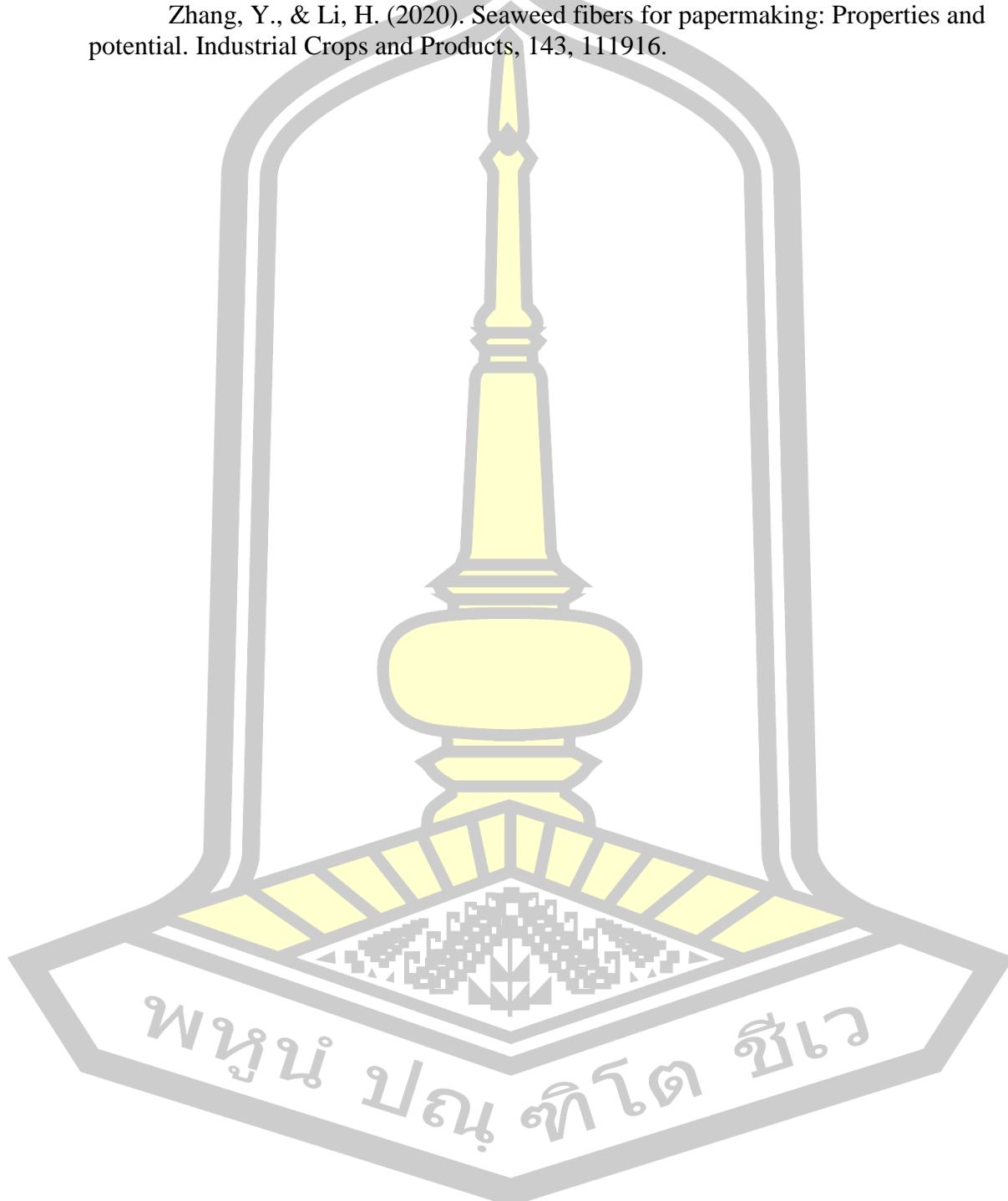
Zhang, Y., Li, M., & Zhao, J. (2022). Challenges in commercializing seaweed paper production. *Resources, Conservation and Recycling*, 174, 105750.

Zhangpu County Party Committee Publicity Department.(1999). "Fujian Zhangpu Paper-cut Collection", Zhangpu: Fujian Fine Arts Publishing House, 10.60.

Zhou Changji. (2017). 500 Nursery rhymes from Southern Fujian. Xiamen: Lujiang Publishing House, 339-340.

Zhang, L. (2019). Colorful Expressions: A Study of Regional Styles in Chinese Paper Cutting. *Folk Art Today*, 33(1), 58-65.

Zhang, Y., & Li, H. (2020). Seaweed fibers for papermaking: Properties and potential. *Industrial Crops and Products*, 143, 111916.



漳浦县物质社区资产代表性调查问卷

尊敬的调查参与者，

我们正在进行一项关于漳浦县物质社区资产的调查，旨在了解并选出最具有代表性的物质社区资产。您的参与对我们非常重要！

指示：请针对以下列出的物质社区资产，根据您的知识和理解，给出您的评价。

基本信息

1. 性别： 男 女 不愿透露

2. 年龄：_____岁

3. 职业：_____

文庙： 非常不具代表性 略不具代表性 一般 较具代表性 非常具代表性

治安堡： 非常不具代表性 略不具代表性 一般 较具代表性 非常具代表性

赵家堡： 非常不具代表性 略不具代表性 一般 较具代表性 非常具代表性

蓝廷珍府： 非常不具代表性 略不具代表性 一般 较具代表性 非常具代表性

漳浦红楼： 非常不具代表性 略不具代表性 一般 较具代表性 非常具代表性

六鳌古城： 非常不具代表性 略不具代表性 一般 较具代表性 非常具代表性

三官大帝庙： 非常不具代表性 略不具代表性 一般 较具代表性 非常具代表性

威惠庙 : 非常不具代表性 略不具代表性 一般 较具代表性 非常具代表性

乌石妈祖庙 : 非常不具代表性 略不具代表性 一般 较具代表性 非常具代表性

漳州滨海火山国家地质公园 : 非常不具代表性 略不具代表性 一般 较具代表性 非常具代表性

漳浦花卉博览园 : 非常不具代表性 略不具代表性 一般 较具代表性 非常具代表性

西湖公园 : 非常不具代表性 略不具代表性 一般 较具代表性 非常具代表性

漳浦茶文化博览园 : 非常不具代表性 略不具代表性 一般 较具代表性 非常具代表性

在上述资产中，您认为哪一个最具有代表性？请列出：

您认为这个资产为何具有代表性？请简述：_____

漳浦县自然资源社区资产代表性调查问卷

尊敬的调查参与者，

我们正在进行一项关于漳浦县自然资源社区资产的调查，旨在了解并选出最具有代表性的自然资源社区资产。您的参与对我们非常重要！

指示：请针对以下列出的自然资源社区资产，根据您的知识和理解，给出您的评价。

基本信息

1. 性别： 男 女 不愿透露

2. 年龄：_____ 岁

3. 职业：_____

古雷滨海风景旅游区 : 非常不具代表性 略不具代表性 一般 较具代表性
 非常具代表性

抽象画廊游览区 : 非常不具代表性 略不具代表性 一般 较具代表性 非常具代表性

林进屿滨海火山景区 : 非常不具代表性 略不具代表性 一般 较具代表性
 非常具代表性

在上述资产中, 您认为哪一个最具有代表性? 请列出 :

您认为这个资产为何具有代表性? 请简述 :



BIOGRAPHY

NAME	Mr.Baoli Cui
DATE OF BIRTH	9 Jul 1987
PLACE OF BIRTH	Wudi County, Binzhou City
ADDRESS	9, Longheli, Jimei District, Xiamen City, Fujian Province
POSITION	9, Longheli, Jimei District, Xiamen City, Fujian Province
PLACE OF WORK	9, Longheli, Jimei District, Xiamen City, Fujian Province
EDUCATION	2021 Graduated from Krirk University Master Degree, Major Artistics 2024 Doctor of Philosophy (Fine and Applied Arts Research and Creation), Faculty of Fine-Applied Arts and Cultural Science, Mahasarakham University

