

**THE UNIVERSITY OF HULL**

# **SILKS OF SENGKANG**

**By**

**Rachael Retter**

**being a project submitted in partial fulfilment for the Special  
Degree of Bachelor of Arts in South-East Asian Studies/ Language  
in the University of Hull**

**October, 1997**





**FIGURE 1**    *“Sengkang Kota Sutera”*  
*Sengkang promoting itself as the ‘Silk Town’ of South Sulawesi*



## ACKNOWLEDGEMENTS

*The research for this project has been both challenging and interesting. It offered me the chance to make Sengkang my home , if only for a short period, and I enjoyed that immensely. I would like to say a warm 'Thank You' to all those that made me welcome during my stay, especially to Tarik and Andi Bau Muddariyah for so much help with my work.*

*On a more academic note I'd like to thank Dr. Ian Caldwell and Fiona Kerlogue for their supervision, Sarah Turner for support in the field and in drafting, and The David Bassett Malaysian Travel Grant for help in financing my research. All the above have helped make this project what it is,*

*TERIMA KASIH,*



ICA



## **CONTENTS**

|                                                     |    |
|-----------------------------------------------------|----|
| List Of Illustrations . . . . .                     | 4  |
| Introduction . . . . .                              | 8  |
| Chapter One : Methodology . . . . .                 | 12 |
| Chapter Two : History . . . . .                     | 16 |
| Chapter Three :<br>The Process Of Silk Production . | 21 |
| Conclusion . . . . .                                | 79 |
| Bibliography . . . . .                              | 83 |
| Appendices . . . . .                                | 86 |



## LIST OF ILLUSTRATIONS

| FIGURE | ILLUSTRATION*                                                                                                | PAGE |
|--------|--------------------------------------------------------------------------------------------------------------|------|
| 1.     | <i>“Sengkang Kota Sutura” - Senkang promoting itself as the ‘Silk Town’ of South Sulawesi.</i>               | 1    |
| 2.     | <i>Map of the Indonesian Archipelago and Sulawesi</i>                                                        | 9    |
| 3.     | <i>In Bugis society silk clothing is still used on special occasions such as for weddings.</i>               | 11   |
| 4.     | <i>The process of silk production.</i>                                                                       | 21   |
| 5.     | <i>The life-cycle of the silk worm.</i>                                                                      | 23   |
| 6.     | <i>Cocoons are slit with a sharp knife to remove the pupa.</i>                                               | 24   |
| 7.     | <i>Eggs are measured into 22,000 lots and funnelled into cloth trays for sale.</i>                           | 26   |
| 8.     | <i>Mulberry bushes - the food of the silkworm and grown in abundance in certain areas of South Sulawesi.</i> | 28   |

---

\* All photographs by Rachael Retter unless otherwise stated.



|     |                                                                                                                       |    |
|-----|-----------------------------------------------------------------------------------------------------------------------|----|
| 9.  | <i>Daun Murbei - a mulberry leaf.</i>                                                                                 | 29 |
| 10. | <i>Silkworms aged about 20 days and in the final stages of maturity.</i>                                              | 33 |
| 11. | <i>Silk cocoons.</i>                                                                                                  | 33 |
| 12. | <i>The village technique of heating cocoons to loosen their silk filaments.</i>                                       | 35 |
| 13. | <i>Silk cocoons are exposed to hot water, sunlight or dry heat.</i>                                                   | 36 |
| 14. | <i>Fifteen to twenty-five filaments are reeled together to make one thread.</i>                                       | 38 |
| 15. | <i>From cocoon to silk thread. Reeling.</i>                                                                           | 39 |
| 16. | <i>Silk thread can be reeled at home.</i>                                                                             | 40 |
| 17. | <i>Farmers who produce excess silk cocoons can sell them to one of four branches of Perum Perhutani.</i>              | 42 |
| 18. | <i>Cocoons that are cut no longer have a continuous silk filament. This silk has to be teased and spun like wool.</i> | 44 |
| 19. | <i>Supplementary weft threads.</i>                                                                                    | 47 |



|     |                                                                                             |    |
|-----|---------------------------------------------------------------------------------------------|----|
| 20. | <i>Silk thread processing.</i>                                                              | 48 |
| 21. | <i>Warping up. Approximately 3600 warp threads will produce a one metre width of cloth.</i> | 51 |
| 22. | <i>Alat Tenun Bukan Mesin (ATBM) or Non-Motorised Loom</i>                                  | 52 |
| 23. | <i>Threading up the loom.</i>                                                               | 53 |
| 24. | <i>Pisau cucuk or threading knife</i>                                                       | 55 |
| 25. | <i>How to weave a check design.</i>                                                         | 58 |
| 26. | <i>'Baju Bodo', the traditional Bugis women's blouse.</i>                                   | 60 |
| 27. | <i>An array of colours and designs: silk sarongs on sale at Amina Akil Silk.</i>            | 62 |
| 28. | <i>Putting the weft thread on a frame.</i>                                                  | 64 |
| 29. | <i>Weaving.</i>                                                                             | 66 |
| 30. | <i>Loom and weaving.</i>                                                                    | 67 |
| 31. | <i>Weft thread painting.</i>                                                                | 68 |



|     |                                                                                |    |
|-----|--------------------------------------------------------------------------------|----|
| 32. | <i>Frames of painted weft threads drying<br/>in the sun.</i>                   | 69 |
| 33. | <i>Ikat tying is very time consuming<br/>and will take a whole day's work.</i> | 70 |
| 34. | <i>How to create the 'pelangi' design</i>                                      | 72 |
| 35. | <i>Sumber Sutera is a showroom in Sengkang.</i>                                | 73 |
| 36. | <i>Griya Sutera is a showroom on<br/>the outskirts of Sengkang.</i>            | 75 |
| 37. | <i>Silk sarongs are very acceptable<br/>formal wear for wedding guests.</i>    | 80 |



## INTRODUCTION

Set in central South Sulawesi and beside Danau Tempe (Lake Tempe), lies the town of Sengkang (see figure 2). Sengkang is the home of a large Muslim community called the Bugis, who for centuries have been practising the craft of silk weaving. In this project the past, present and possible future of this industry will be described and discussed. The history of silk weaving is shrouded in mystery and is thought to have been introduced first as a cloth for trade, and later as a skill to be practised in the ancient courts. The craft is believed to have been brought to the area through the Bugis trading interests - but did they themselves bring the new skill ? Or was it brought by their Indian or Chinese rivals who frequented the area ? This is discussed in Chapter Two but however it came, the silk sarong (and its complement of accessories) and its production are firmly rooted in the Sengkang culture of today. The town is now recognised as “Kota Sutra” - the “Silk Town” of Indonesia (see figure1).<sup>1</sup>

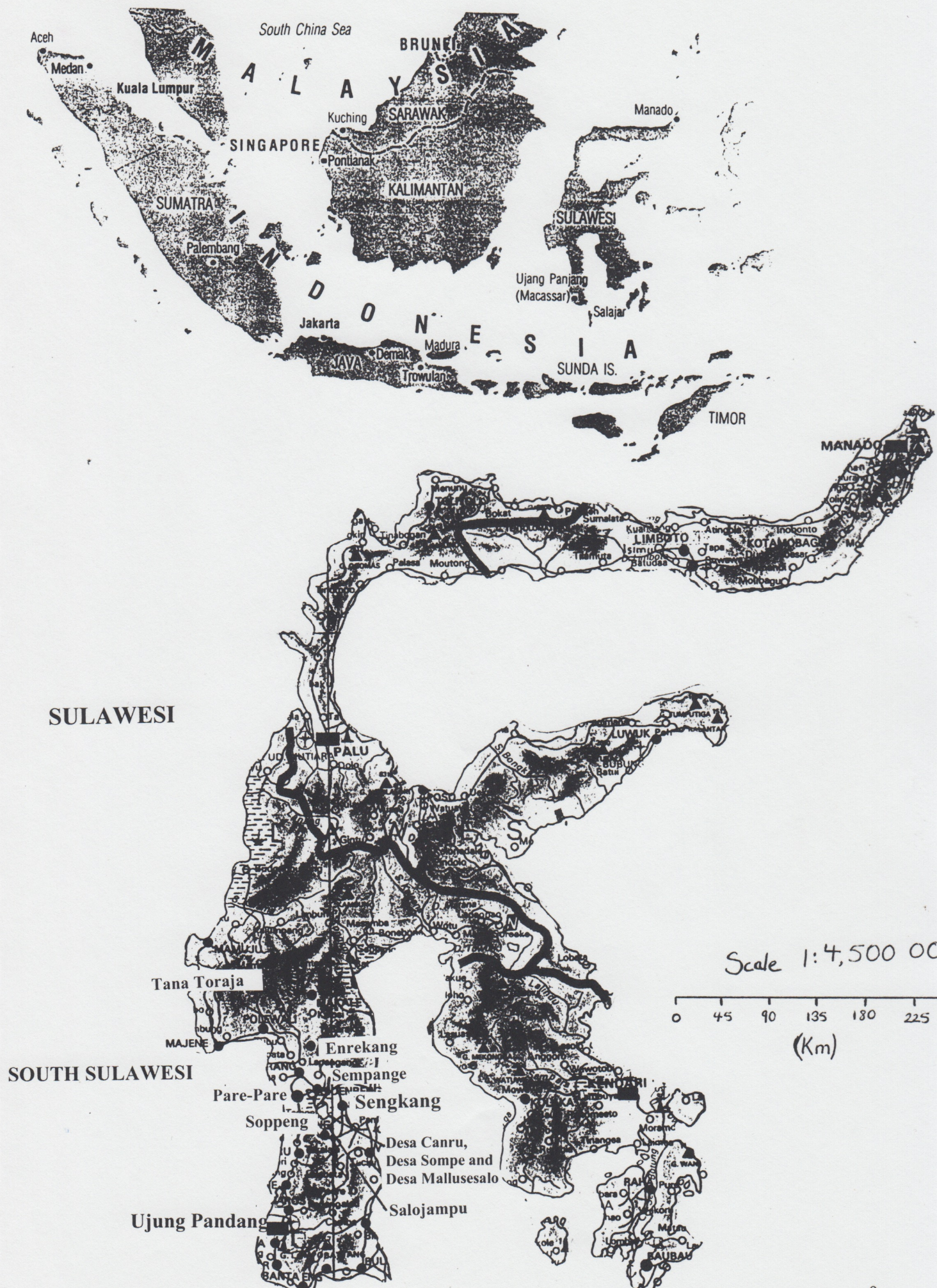
In the last 60 years the industry has gone through many changes with the introduction of new technology, the creation of new weaving designs and a developing retail market for silk. These changes have enabled the industry to grow and become firmly established, with local people producing their own silk cocoons and thread instead of relying on imports of raw materials. The Indonesian Government has had a keen interest in establishing the silk industry and many visitors are also interested in the local craft and its production.

The process of silk production begins outside the Sengkang area at Tajuncu (Soppeng District) with the production of silkworms at a factory based on Japanese technology. Large numbers of silkworms are then raised in the Sengkang area, being fed large quantities of mulberry before they build the valuable silk cocoon. One worm can

---

<sup>1</sup> Sengkang is the main town in the Wajo district of South Sulawesi. When talking about silk, people often refer to Sengkang rather than Wajo, although farming and thread production take place throughout the Wajo region. I shall follow the practice of naming the town when talking generally, but will refer to specific places when necessary.





**FIGURE 2** Map of the Indonesian Archipelago and Sulawesi



produce surprisingly large quantities of thread, but its 'spider-web' fineness requires the filament to be reeled together, with up to thirty threads, to make it strong and suitable for weaving. The process from here on takes place both in the villages surrounding Sengkang (by individuals) or in workshops in the town itself. The next step is to prepare the thread for the loom. There are several stages to this, including *the dyeing of thread*, and it can take almost three weeks of preparation. With a large variety of designs and techniques these preparations vary depending on the type of cloth to be produced finally. These technical aspects of silk cloth production are discussed in Chapter Three.

The retail of silk is also going through a number of changes. Previously the ownership of silk clothes reflected wealth and status and was the prerogative of royalty and nobility. Today the cloth is found at the local market, available to locals, tourists, throughout all Indonesia and the wider regional market. Despite such changes, and the corresponding decline in 'status value', the silk cloth is still esteemed as clothing to be worn with pride on special occasions (see figure 3). With this in mind one can see that the local value of the cloth is not likely to decline. If the silk industry continues to change, as it surely will, there is likely to be a greater participation on the national and international markets, although this may involve further sacrificing some of the traditional designs and values. These developments are looked at in Chapter Four.





**FIGURE 3** *In Bugis society silk clothing is still used on special occasions such as for weddings. Here we can see a man's check sarong and a woman's 'baju bodo' blouse.*



## **CHAPTER ONE**

### **METHODOLOGY**

This project aims to explain and help the reader gain an understanding of the entire process of silk production in the Wajo district of South Sulawesi. First though, the study itself should be put into context. My interest in Sengkang's silk industry comes from a fascination with Indonesia and its material culture. Traditional cloths are of special interest to me, in particular their role in present day society. Island societies such as Java, Bali and those further east in the Indonesian archipelago are well known for their batiks and cotton weavings which are well documented. Meanwhile Sengkang has been the subject of very little research despite its importance at both a local and national scale.

As there is little published information to be found on these silks woven by the Bugis people, preparing for research before entering into 'the field' was difficult. The initial literature review stage included visiting the University of Hull library, the Singapore National library and the Universiti Sains Malaysia library. Here I studied the basics of silk production in the *Textile Handbook* (The American Home Economics Association;1960) and the *Encyclopaedia of Textiles* (American Fabrics Magazine;1972). I then proceeded to research the relevance of textiles in Southeast Asia through Fraser-Lu (1988) and various works by Gittinger (1985, 1987, 1992). This led me to more specific publications on Indonesian textiles including Hitchcock (1985,1991) and Bugis silks by Pelras (1996), Zerner (1982) and Crystal (1979).Through this review the silk textile industry could be better understood and knowledge later expanded upon whilst in the field.

I then spent two months in South Sulawesi, the majority of that time in Sengkang itself. During this time I held interviews with local Government officials in Departmen Perindustrian, Unit Pelayan Teknis Tekstil and Perum Perhutani and a large number of local experts including silk worm farmers, craftsmen and business people.(See Appendix A for list of informants). The vast majority of these



interviews were carried out solely in *Bahasa Indonesia*, the Indonesian national language.

The information gathering sessions can be separated into four groups according to the style and situation in which they were carried out. Firstly, official interviews were of a semi-structured and formal style. These were usually carried out in Government of business offices with questions prepared in advance. The second style was semi-structured and informal, used when gaining a working knowledge of certain processes such as in the homes of silkworm raising families or the homes of weavers. There were some prepared questions, but during the interview more specific questioning was also necessary. The third style was useful in gaining more general information about the area and local customs. This was undertaken in a loose informal style with the guides and those that enjoyed discussing the customs and values of Wajo. Finally, as a long period of time was spent in the area, observation techniques were used in learning about the technical and artistic practices in producing silk cloth. This proved of great value in understanding some of the more complex processes that were difficult to accurately describe. Through observation it also became apparent that information about measurements and practices needed to be double checked. These four paths of research make up the bulk of the resources which I draw upon herein.

Through semi-structured interviews with informant 32 (who tried to give the industry a boost in the 1970s) much local information (in the form of pamphlets and reports) was gained. Many of the publications were dated from the 1970s, but this was nevertheless a help in assessing some of the industry's more recent changes.

When I first arrived in the area I found that professional tourist guides were ready to assist visitors in gaining access to observe the silk processing. A guide was of great use as the various stages of processing are scattered around the area. Guides were also useful in explaining the basics of production and technical vocabulary specific to the textile industry. Later I returned to the locations of each stage of the process (sometimes on several occasions) to carry out more in-depth interviews on technical issues and to observe the processes more. Spending two months in South Sulawesi (and over one month of that in Sengkang) also meant that I could observe



that which the passing tourist does not : the role of silk in Bugis society today. The silk sarongs, *baju bodo* (traditional blouses) and other accessories are the appropriate attire for wedding parties, conveying wedding invitations and rites-of-passage ceremonies. These festivals illustrate the social and cultural need for the continued production and I was able to attend a wedding and a rites-of-passage ceremony.

In researching this subject I was faced with both positive and negative aspects concerning undertaking such research. The positive aspects are as follows:

Firstly the silk processing is fairly contained within the Wajo district and this gave a natural geographical limit to the area that I had to cover. Travel was contained within that area (with the exception of trips to Tajuncu, Soppeng and Ujung Pandang) and so the project did not become unmanageable. Secondly, as relatively little research has been carried out either in the area or concerning the silk in general, local people were very helpful and willing to pass on information. This openness may also have been due to being a female whilst researching a female dominated craft. It is mainly women participating in the various silk processes and a male researcher may have felt like an intruder in this domain. As a female I felt welcome to sit and discuss, to watch and learn in a relaxed atmosphere without intruding or causing embarrassment.

The fourth advantage was having an advanced knowledge of the national language *Bahasa Indonesia*. A small percentage of the Wajo population are able to speak English but much of the information I gained was through interviews and written sources which were in *Bahasa Indonesia* only. This also had the secondary effect of reinforcing my language skills and increasing my knowledge of technical vocabulary. The final positive aspect was that my time in Sulawesi coincided with an international conference on South Sulawesi's history and culture. This allowed me meet history and anthropology experts in the field such as Cambell McKnight, Christian Pelras, Elizabeth Morrel and Andi Nurhani Sapada. These people shared more knowledge and information concerning the silk industry's development and on South Sulawesi in general.

These advantages were obviously balanced by a few problems, as follows:



First was the problem of enquiring about weights, measures, origins of various goods, production statistics and quantities of sales. Answers to these questions were often vague, for example the common answer of '*banyak*' meaning 'much' or 'many'. Other answers seemed to be 'plucked' from the air and with common sense I could deduce that they were incorrect. This is an Indonesian trait that saves 'losing face', as to give no answer would be impolite and so an answer is sometimes falsified.

The second problem involved a lack of local, up-to-date, printed material concerning the industry. There seems to have been little local research conducted in the field, and this meant that my project work had to begin 'from scratch'. Other sources such as the *I La Galigo* (Kern 1939) and Bugis *Lontaraq* (Matthes 1875) both historical pieces of literature, would be good for investigating the history of silk further, but this would entail the transliteration (from Bugis script) and translation (to Indonesian or another foreign language) of numerous volumes. The third problem was that by the end of my research period I had seen none of the old-fashioned back-tension looms used in weaving silk. In the past numerous houses used these looms for weaving cotton, and previously they were used for silk too. Despite reassurances that silk is still woven on these *gedogan* looms I only encountered silk on the free-standing *ATBM* looms (discussed further in Chapters Two and Three). These challenges have contributed to making this an interesting project to undertake. The history of Sengkang's silk will now follow.



## CHAPTER TWO

### HISTORY

The origins of silk and sericulture (raising the silkworm through its life-cycle) are somewhat unclear, even today. However, experts do tend to agree that they can be traced back to China and a date circa 3000 BC (Hitchcock 1991;34). Chinese sources from this time record how the Empress Si-Ling devoted her time to sericulture and made it fashionable. The Chinese, realising its trading value, made silk one of their well guarded secrets and kept it so for centuries (American Fabrics Magazine 1972;126). How the craft then reached the shores of Sulawesi is even more of a mystery, but it is likely to be connected to the sea faring and trading of the Bugis which has been taking place since at least the 17th century. Having a good command of navigation and the seas, the Bugis made contact with many parts of South-East Asia, both through trade and alleged piracy (Fraser-Lu 1988;189). Clues to the introduction of silk in the area can be found through the language, geography and technical designs with each of these leading historians to different conclusions.

One theory is that silk was brought directly from China, by the Chinese, around the 1400's. Although there are strong Chinese communities in the area, making this is a valid idea, historians cannot prove Chinese-Bugis contact before the 1600s (Zerner 1982;47). Another theory is that the Indonesian word for silk (*sutra* (Echols 1989) is an indicator of its origins, as the Sanskrit word for silk is *suttara*. The similarities are obvious and present the possibility that silk was introduced via India or by Indian traders, possibly around 1000 AD (Hitchcock 1991;34).

The Bugis word for silk is *sabbe*, which Maxwell (1990) relates to the Thai and Minangkabau word for scarf - *sabai*. This implies the Bugis people first encountered silk as a finished woven cloth rather than an art or weaving industry (Pelras 1996; 247).

A local expert (Informant 32), a Bugis princess who is the last in the family line and an expert on the local silk industry's developments has considered this 'origin' question



in depth and believes the silk culture came directly from China, perhaps passing through the Philippines and North Sulawesi. To reach Wajo district, she believes the knowledge of silk came via a great river that ran from Mandar. This river no longer exists and in fact its existence is unproven. The final theory is concerned more with the weaving of silk and Pelras believes this was introduced by Malay traders during the fourteenth and fifteenth centuries. This is a valid suggestion as certain loom parts (the cloth beam and comb) have their names rooted in Malay (Pelras 1996;248).

As Indonesia is a nation surrounded by sea its cultures have been open to China, India, The Middle East and Europe. Whatever route the introduction of silk took, its weaving was taking place among the Bugis from at least the end of the sixteenth century. Prior to this all silk cloths were imported (like the valued Indian patola) and all silk threads came from beyond Sulawesi's shores (Pelras 1996;248).

It is in 1701 that silk is referred to directly in the writings of an outsider. At this time a Nicholas Gervaise was living in the city of Makassar (currently named Ujung Pandang). In his book he comments upon the abundance, richness and variety of silk seen in the area (Fraser-Lu 1988;189) saying "all the manufacturers of the Kingdom are settled....for they have a great plenty of Cotton and Silk" (Gervaise 1701; 61). In about 1785 another foreigner, Forrest, wrote on the popularity of cotton cambays and silk woven belts from the Bugis. These were made for export throughout the region and must have been of good quality and design because they were seen to threaten the Bugis imports from Indian regions (Pelras 1996;248).

From the time silk was first introduced to the area it is said that the industry, and the cloth's uses, have evolved rather than revolutionised (Mastang 1991;49), meaning that new ideas have gradually rather than having been introduced from various parts of the world, becoming part of the silk industry that we can see today.

Before the 1930s cotton dominated the Sulawesi cloth industry and market. Both cotton and silk were woven on back tension looms and followed geometric weave designs such as stripes and checks (Zerner 1982;50). The patterns and colours were also a reflection of status. In the Luwu district (north of Wajo) a low class citizen



could be beaten for wearing purple and green as these colours were restricted for royalty alone (Zerner 1982;52).

Further contact with traders brought variations such as the weft thread ikat technique and gold or silver supplementary weft threads which can be traced back to the 14th or 15th century (Indonesian Arts Society 1976;6). Both are thought to have appeared due to contact with Muslim traders from India or the Middle East (Hitchcock 1991;79). These designs are associated with coastal areas (Indonesian Arts Society 1976;3) as they originate from Islamic court-based societies (Hitchcock 1991;79).

Since the 1930s and especially since the nation's independence in 1945, the silk industry of South Sulawesi and Sengkang has taken many steps forward in development. The most dramatic step came with the introduction of aniline chemical dyes in 1936. Previously colours had been gained from natural dyes and were dull and sombre. To give a rich shine to quality cloths they had been rubbed with cowry shells (Zerner 1982;47). With the new dyes brought by Dutch traders the Bugis could achieve bright new colours bringing out the silk's lustre and shine (ibid;50). These colours are the ones which are popular in Sengkang today. As a result of the chemical dye introduction early this century, knowledge of the recipes and uses of more traditional dyes has died out.

Also in the 1930s came the painted weft thread design. It is known in the region as *cetak* meaning 'to print' and is described later in Chapter Three. This design gave designers the ability to dye threads many colours in a less time consuming and complex way than ikat (also described in Chapter Three). The idea was brought from the islands of eastern Indonesia and together with dye developments silk took priority over cotton production.

In the 1950s the government began promoting the *ATBM* (*Alat Tenun Bukan Mesin* (non-engine powered loom) across the archipelago to weaving communities (ibid;49). This free standing, rigid framed loom was developed in Bandung in 1929 (Informant 20) and gave a much faster and uniform production than the back tension looms. Where before the *gedogan* loom was the only kind in use, the *ATBM* now dominates the industry with 6519 *ATBM* looms to 5553 *gedogan* looms in Wajo (Informant 5).



This has sped up production considerably and changed retailing patterns too. Items that were previously expensive and unattainable by the lower classes became popular and affordable, if only for use on special occasions (Crystal 1979;54).

In 1965 Andi Bau Muddariyah (Informant 32) experimented with the Thai loom for silk weaving. The basics of a Thai loom are very much like the *ATBM*, but even with a Thai expert's help the project was not a success (Informant 6).

Up until the 1960s all silk was imported as thread and then processed. Today, up to 60% of silk thread comes from Java and the rest is of local production. Experiments with sericulture were successful at first, but then epidemics hit the silkworm stocks and the locals were forced to resort to imported Japanese cocoons (Informant 45). Within a decade silk production had become a government concern and a Japanese-Indonesian co-operative was put into action in the district of Soppeng, South Sulawesi (Fraser-Lu 1988;189). In 1976, the sericulture project began in Tajuncu (Soppeng) as the beginning of a five year plan, costing US\$7.1 million. This was in order to achieve "consistently high sericulture techniques, resilient silk worm stocks, and raise the levels of indigenous silk" (Zerner 1982;49). Tajuncu's factory is now the sole distributor of silk worm eggs in South Sulawesi and the introduction of new threads, dyes and machines has developed Sengkang's silk industry beyond that of a cottage industry.

Previously silkworm raising was aimed at women in order that they could work at home and contribute financially to the family without neglecting their role as wives and mothers (Seri Pengetahuan Populer 1964;1). At this time local women were considered "Wajo women" only if they could weave (Mastang 1991;47). The women's commitment to weaving led to the popularity of silk in the South Sulawesi region as well through other islands of Indonesia. Sengkang silks have become a part of the international market too but its success is not yet measurable (Mastang 1991;68).

The history of Sengkang's silk origins is somewhat of a puzzle, but the early days of silk in Sulawesi reflect the history of the sophisticated and business-spirited Bugis. Many changes have taken place since the arrival of silk cloths and silk production. In



the last sixty years the Indonesian Government has played a dominant role offering a great deal of financing to large projects. Such changes may have decreased the value of the silk sarong from a prized status object to that of an item for all classes on special occasions, reflecting a certain amount of adaptability on the part of the Bugis (Mastang 1991;64). They now have a craft, its history and culture with which to affiliate themselves (Zerner 1982;55). The following chapter will now detail the production process in Sengkang as it can be seen today.



## CHAPTER THREE

### THE PROCESS OF SILK PRODUCTION

In this chapter the process of silk production will be detailed from its initial stages, incorporating egg production in a local Soppeng factory and the farming of silkworms, through to the processing of the threads and finally the marketing of a range of silk products, on a local, national and international scale. These production processes can take place over a minimum of two months, 1 month from egg to silk thread and a further month from thread to finished cloth. The outline of this process is illustrated in Figure 4 (below) which forms the structure of the following chapter.

| PROCESS:                                               | Location:                     |
|--------------------------------------------------------|-------------------------------|
| EGG PRODUCTION . . . . .                               | Tajuncu, Soppeng District     |
| FARMING OF SILK WORMS<br>AND FEEDING PROCESS . . . . . | various Wajo villages         |
| REELING PROCESS . . . . .                              | various Wajo villages         |
| MARKETING OF RAW MATERIALS . . . . .                   | .Wajo markets                 |
| - raw silk thread                                      |                               |
| - dyes                                                 |                               |
| - supplementary weft threads                           |                               |
| - starch                                               |                               |
| FROM THREAD TO CLOTH . . . . .                         | local villages and Sengkang's |
| - check design                                         | showrooms and factories       |
| - <i>baju bodo</i>                                     |                               |
| - <i>samarinda</i> (described later)                   |                               |
| - thread tie dye                                       |                               |
| - cloth tie dye                                        |                               |
| - batik                                                |                               |
| MARKETING OF FINISHED PRODUCTS                         | -local and Sulawesi           |
|                                                        | -national                     |
|                                                        | -international                |

**FIGURE 4 : The process of silk production**



## Egg Production

Before the mid-1980s silk worm production in South Sulawesi was a small scale industry undertaken by farmers and craftsmen. The operation took place at a village level and was very basic when compared to today's technology. Since 1986 the Perum Perhutani<sup>1</sup> company has been established and operating in Tajuncu, Soppeng District<sup>2</sup>, and this is now where all South Sulawesi's commercially produced silk worm eggs are produced. There are four branches of the organisation but this is the only one that is concerned with both egg and thread production. The others are concerned only with thread.

The technology involved in these affiliated companies is a direct copy of that developed in Japan. A number of employees have also been sponsored to learn about Japanese sericulture in Japan. Such developments have resulted in improved silk quality, higher production rates, disease detection and quality control, all of which did not exist previously. What follows is a description of the silkworm lifecycle beginning with the cocoon stage (see Figure 5). The description will follow the process as observed at the Tajuncu laboratory.

Three kinds of silk cocoon can be seen at the factory: Chinese (C), Japanese (J) and the quality hybrid known as F1. The class of the cocoon can be determined by its shape as the Chinese is round, like a miniature ping-pong ball, and the Japanese is peanut shaped. The hybrid combination is oblong in shape (the hybrid is not used in further breeding and so its progress through the cycle is detailed later). The Chinese and Japanese types are used both for breeding and for their silk cocoons. This means that the pupa must be extracted from its cocoon in order to live and reproduce before it develops into a moth and independently breaks free from its cocoon, damaging the silk filaments through liquid secretion.

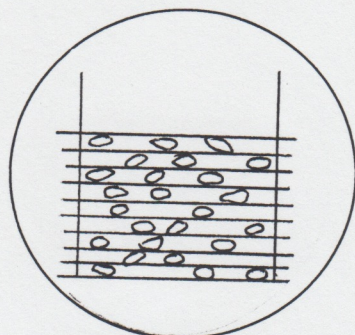
The pupae are removed from their cocoons with a swift knife action which leaves an exit hole large enough to remove the animal inside (see figure 6). This severs the previously continuous silk filament and these damaged threads will later become 'spun silk' rather than 'raw silk' (described in more detail later in this chapter).

---

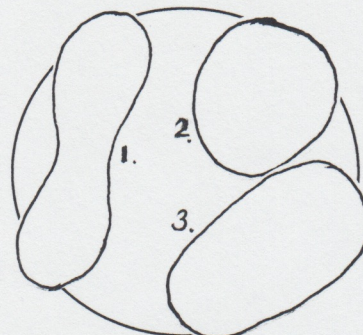
<sup>1</sup> This is a government subsidised project that is concerned with various crafts throughout Indonesia. In South Sulawesi there are four branches concerned with silk production. These branches are in Enrekang, Sidrap, Soppeng and Wajo.

<sup>2</sup> The focus of this project is on Wajo but it is necessary to look at Soppeng as it is the centre of silk worm egg production in South Sulawesi.

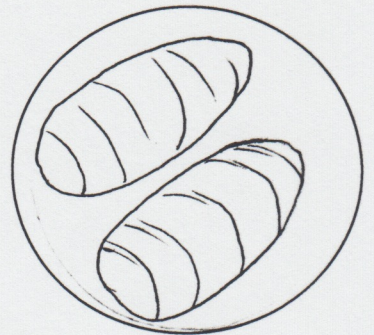




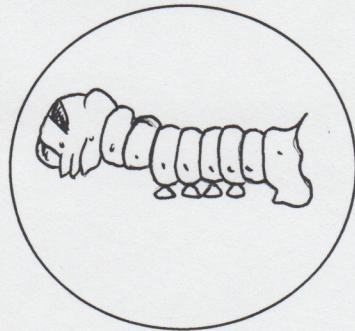
*Cocoon Building*



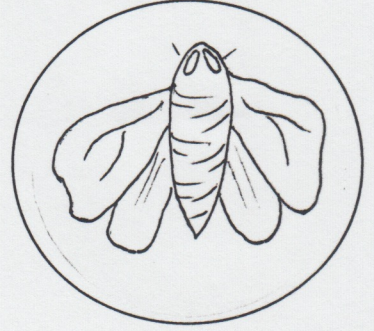
*Cocoons*  
1. Japanese  
2. Chinese  
3. Hybrid F1



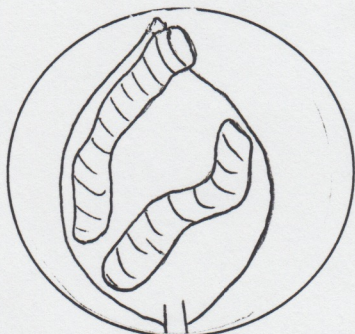
*Pupa*



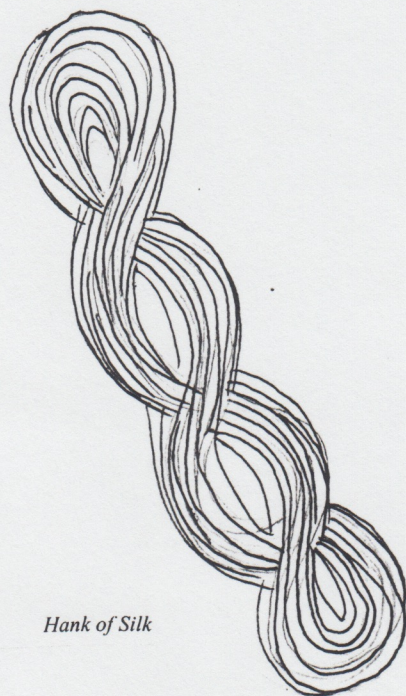
*Days 18-22*



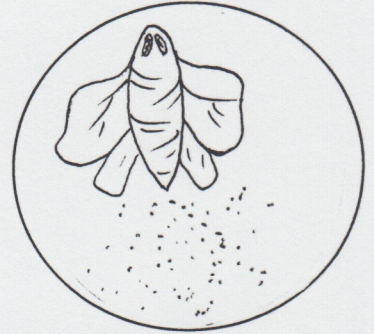
*Moth*



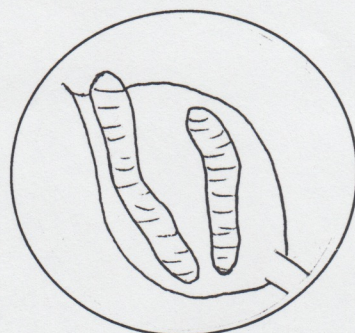
*Days 13-16*



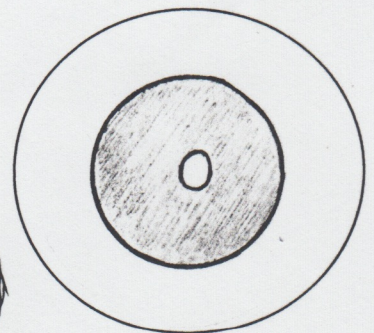
*Hank of Silk*



*Egg Laying*



*Days 9-11*



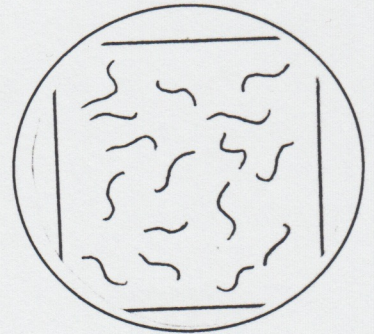
*Egg*



*Days 5-7*



*Days 1-3*



*Hatching*

**FIGURE 5 The Life-Cycle of he Silkworm**

Source: As illustrated in Haji Mustakim Showroom, Sengkang.





**FIGURE 6** *Cocoons are slit with a sharp knife to remove the pupa. The Chinese and Japanese pupae will be used for breeding and the cocoons for spun silk.*



The Chinese and Japanese pupae are kept separate at all times and taken to refrigeration rooms of 7°C until requirements demand. The pupae are then removed and allowed to develop into white silk moths (*Bombyx mori*) for breeding. The mating process must take place in three batches in order to maintain the Chinese and Japanese pure-breds (C-C, J-J (for later breeding) and to produce the F1 egg (C-J (for a more detailed illustration of F1 production see Appendix B)).<sup>3</sup> To mate, the male and female moths are 'married' for four hours. After being carefully separated the male is removed for refrigeration (at 7°C) once more. Males can be 'used' up to two or three times before they die. In the meantime the cold is supposed to build up their stamina and strength, as well as lengthen life expectancy from three to five days. Meanwhile the female is placed on clean brown paper to begin laying eggs. Each moth can lay between three and five hundred eggs before dying.

Freshly laid eggs are smaller than a pin head and whitish in colour. Many moths will lay on one piece of paper, with multiple sheets then hung in the egg bank refrigeration rooms at 5°C.<sup>4</sup> Before the eggs are saved in the egg bank the moths are inspected by microscope for disease. 'Pebrine' is a common disease and if this (or any abnormality) is found the eggs will be discarded, whilst healthy eggs can be kept in refrigeration for up to 6 or 8 months. If allowed to mature the egg will darken and hatch within a week. When internal or external demands require, eggs are removed from the cold storage and allowed to hatch. This is done in two blocks, at the beginning and middle of each month, and around these dates the factory is a hive of activity as all three kinds of eggs are hatched and F1 eggs are packaged for sale. Eggs are sold in lots of 22,000 after being measured out, funnelled into a cloth sided box (1x9x18cm) and sealed in and labelled with the expected hatching date (see figure7). Each of these boxes is sold for Rp13,000 (approximately £3.50) with that price being heavily subsidised by the government. Usually one village representative will collect silk worm eggs for himself and his neighbours. One box is usually sufficient for one family. It is in compact boxes that the F1 grade eggs make their way to Wajo and Tajuncu. Test results show that farmers can expect a 90% hatching rate.

---

<sup>3</sup> The F1 hybrid produces the best quality thread and entails mating Chinese (C) and Japanese (J) silk moths.

<sup>4</sup> There are six of these rooms each containing approximately 242 million eggs.





**FIGURE 7**      *Eggs are measured into a 22,000 lots and  
funnelled into cloth trays for sale.*



## **FARMING OF SILKWORMS AND FEEDING PROCESS**

The villages well known for silkworm raising are situated about 15km south-west of Sengkang, towards Soppeng, and called Desa Canru, Desa Mallusesalo and Desa Sompe. Here business is carried out on a small scale.

Families feed their silkworm stock with just a couple hectares of mulberry plantation and these can be seen dotted around the Wajo countryside (see figures 8 and 9). There is a system of rotation on the mulberry crops so that as one hectare is being used to feed that month's batch of worms, the other hectare is recovering from the previous month. Silkworms require fresh mulberry leaves daily and this can prove problematic when the mulberry crop is smaller in the dry season.

In some households the task of mulberry farming is shared between men and women, but generally it is considered a man's occupation, whilst it is considered the woman's occupation to raise the worms. Silkworms are extremely sensitive creatures (it is often said this is why women take care of them!) and they can under-produce or even die if exposed to wet weather or thunderstorms. To prevent problems caused by atmospheric changes a sheet of brown paper is laid over the young worms. Worms are also in need of protection from chickens, house lizards and ants, so are kept safe in the family home under the supervision of women.

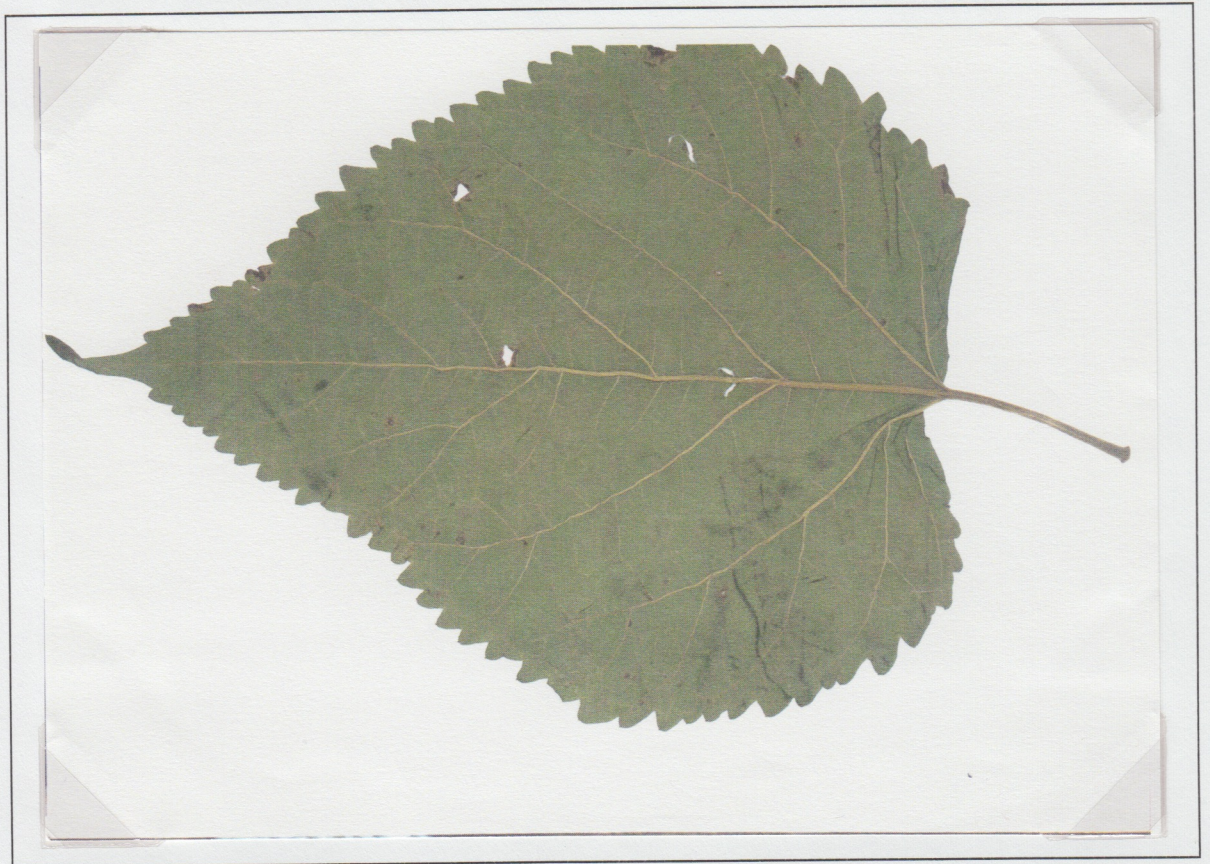
At the beginning of the month worms can be seen in the first stages of development in the villages. On arrival from the laboratory, eggs are removed from their packaging and placed on a cloth tray where they will hatch within a day or two (usually in the morning). The tiny worms are then given a bed of finely chopped, fresh mulberry leaves. The worm's size limits them to chopped leaves, which they must begin eating in order to grow to their full potential.





**FIGURE 8** *Mulberry Bushes - the food of the silk worm and grown in abundance in certain areas of South Sulawesi*





**FIGURE 9** *Daun Murbei - a mulberry leaf*



The life-cycle of the worm can be seen in twelve stages, five of which concern the growth of the actual silkworm (refer again to figure 5) defined by its sleeping patterns. After hatching, the worm eats for three days and sleeps for one. At this time it is no bigger than a thread and while it sleeps waste such as mulberry stems, uneaten leaves and excreta are removed. Stages two and three both consist of three further days of eating and one further day of sleeping. Stage four consists of four days of eating followed by one day of sleeping. The fifth and final stage consists of five more eating days. The total time of this growing period is 22 days (see figure 10). During the last stages the worms are fed twice a day on full branches of mulberry. They eat so readily that they can be heard by the human ear. These worms are now 30 times their original length, 70 times their original size and 10,000 times their original weight (American Fabrics Magazine 1972;131+137).

Around the 22<sup>nd</sup> of each month the worms stop eating because they are fully mature and ready to begin spinning their silk cocoons. Farmers know when a worm is 'ready' because it raises and twists its head, secreting shiny white fibres. At this point they are removed individually to a new shelving system. The shelves are hung beneath the house to prevent rat intrusion. The shelves are of planks or bamboo and they are laid on top of each other with approximately 2.5cm between each slat. As one shelf is filled with about 30 worms, so another is slotted in above. Here the worm will build its cocoon over three or four days. At first a web-like structure is strung between the shelves. Then wall within wall of filaments are laid inside producing the oval cocoon. A gummy sericin glue helps solidify the cocoon walls and by day 27 the cocoon is ready (see figure 11). The next process is reeling.





**FIGURE 10** *Silk worms upon a bed of mulberry leaves. Here aged about 20 days and in the final stages of maturity. Their eating is clearly audible, but soon they will be 'full' and ready to begin spinning their cocoons.*





**FIGURE 11**      *Silk cocoons.*  
*A silk worm can construct its cocoon within a few days and  
lives inside as a larva, preparing to hatch as a moth.*

*Photograph by Sarah Turner*



## THE REELING PROCESS

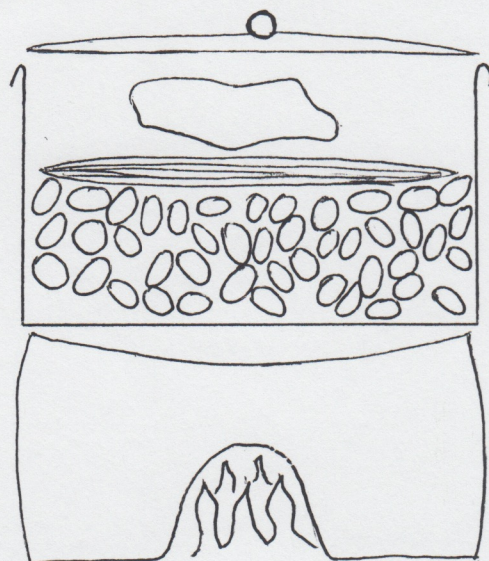
Reeling is the process of unwinding the silk filament from the cocoon. If there are no malformations to the cocoons then the filament should reel off in one continuous thread. So long as they do not over produce, farmers can undertake this work themselves and women can be seen reeling their silk below their houses. If farmers over produce they can sell their excess cocoons back to the local branch of Perum Perhutani. I observed the reeling techniques in various houses at Desa Canru and Desa Mallusesalo.

Newly formed cocoons will be ready for reeling after about five days, and it is important to reel before days ten to twelve because at this point the chrysalis will emerge as a moth. If this is allowed to happen the silk will be impaired by a chemical secreted by the pupa in order to break down the fibres. To prevent this from happening the pupa must be killed by exposure to heat either in the form of direct sunlight or boiling water (see figures 12 and 13). The latter is most logical and most popular as it also forms the beginning of the reeling process. The former is used when there are too many cocoons to process in a few days. When they are dried they can be stored and reeled at a later date.

To begin reeling, a manageable volume of cocoons are heated (as in Figure 12). Two litres are said to be dealt with at one time, but as there was no means of accurate measurement I assume it was measured by sight or 'guesswork'. Submerging the cocoons in boiling water for 15 minutes is enough to weaken the sericin gum and so loosen the cocoon's threads. When this is achieved the cocoons are transferred to a bowl and placed by the reeling machine (as in Figure 13). This task is considered a woman's task (perhaps due to its being home-based) and their machines are based on a bicycle mechanism which takes between one and three operators, depending on the model and women's skill.



**FIGURE 12**      **THE VILLAGE TECHNIQUE OF HEATING**  
**COCOONS IN ORDER TO LOOSEN THEIR SILK FILLAMENTS**



Lid

Stone

Metal Plate

Cocoons in Water

Aluminium Cooking  
Pot

Free Standing,  
Terricota Fire place

Wood Fuel Fire





**FIGURE 13** *Silk cocoons are exposed to hot water, sunlight or dry heat. This kills the larva in order that it does not develop into a moth breaking open the cocoon and breaking the otherwise continuous silk filament.*

*Photograph by Sarah Turner.*



The cocoons are stirred by a stick, the filaments collected together and the waste and soiled filaments twisted off (see figure 14). A group of cocoons, numbering between 10 and 30, are transferred to the second bowl, combed with an aubergine leaf which has rough hairs on it and sets the filaments in order, and threaded through the machine.(see figure 15) The eyelet brings the filaments together into a thread with a twist, then sends it on to reels one and two. The downward thread twists eight times with the upward thread and this serves to wring out excess water and to keep thread size constant. Any knots would be discovered here, inevitably breaking the thread. The thread continues to the guide eye which is mounted on a sliding rod to spread the thread across the reel, producing a hank measuring about 7cm wide (see figure 16).

Between four and nine hundred metres of silk can be wound off one cocoon and the power used to do so is entirely manual. As one filament breaks or comes to an end the dead pupa, in a thin case of silk, sinks to the bottom and a new filament is laid across those already being reeled. This filament is then twisted into the thread. The reeling machines have two sides, so two hanks can be reeled in parallel before being dried in the sun. The hanks did not seem to be measured, but when removed they appeared to be the same size and are now bundles ready for sale.

A household will hope to produce 20kg of cocoons from one box full of eggs. In the rainy season a family will expect production to be lower, but during an average month between four and six kilograms of cocoons will produce one kilogram of reeled thread. After one day of reeling about one kilogram of thread is produced and so this is a process that takes three or four days.





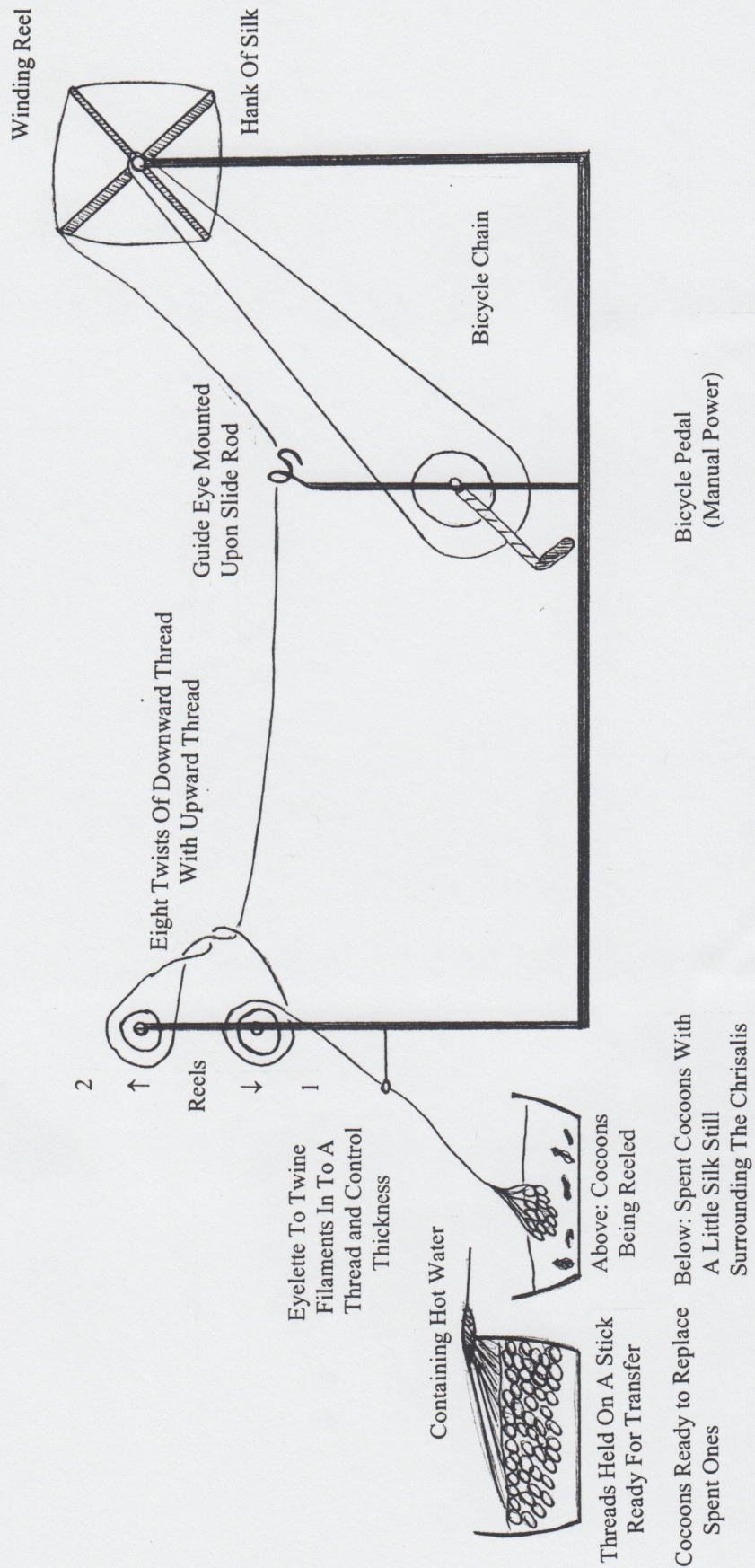
**FIGURE 14**      *Fifteen to twenty-five silk filaments  
are reeled together to make one thread.*

*Photograph by Sarah Turner*



**FIGURE 15**

**FROM COCOON TO SILK THREAD - REELING**







**FIGURE 16** *Silk thread can be reeled at home. Each filament can be up to 900m long. After reeling the neat hanks are dried and ready to be sold at the local market.*

*Photograph by Sarah Turner*

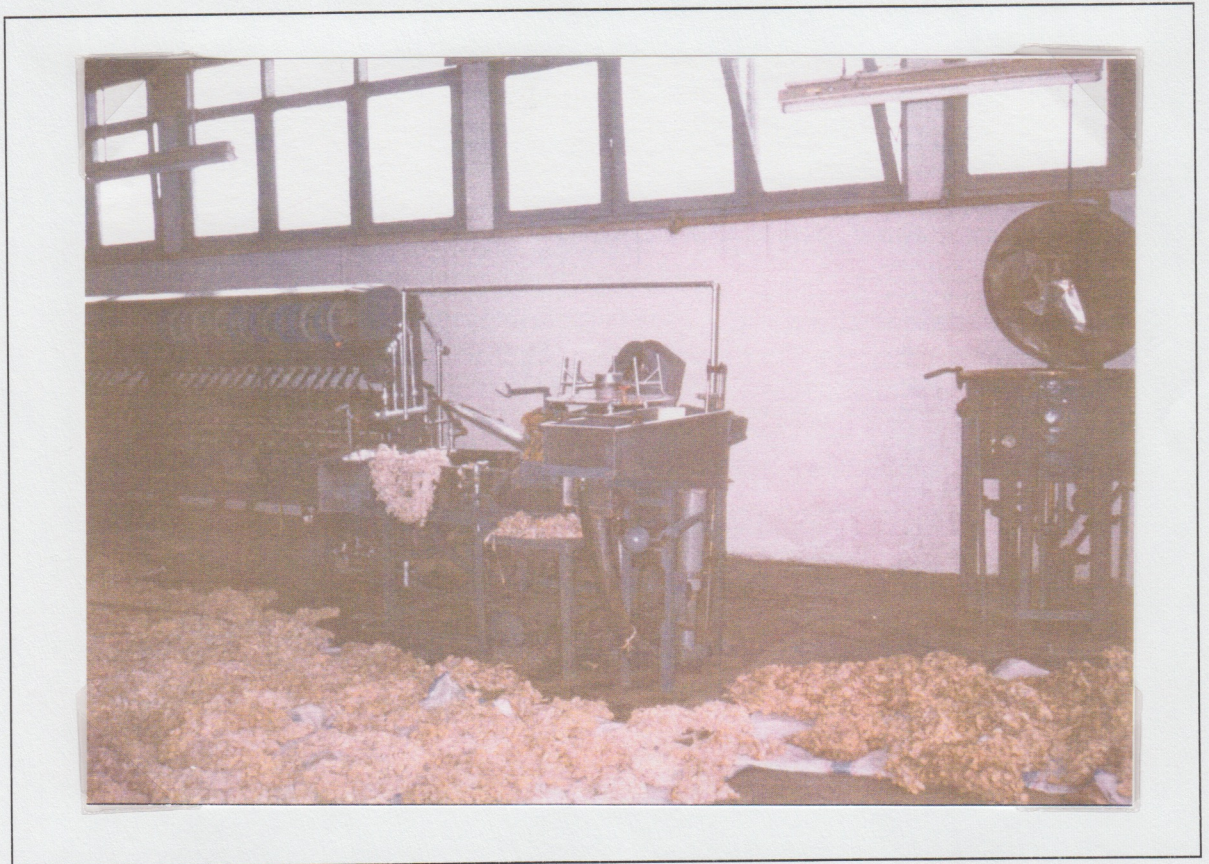


If farmers do over produce cocoons, or do not possess the equipment to reel their own produce, then Perum Perhutani has a system for buying back excess cocoons. They pay Rp 8,000 (approximately £2.10) for each kilogram of cocoons and then they put them through the sophisticated Japanese reeling machines (see figure 17). This process consists of steam drying (to kill the pupa at 80-85°C), boiling for five minutes (at 75-90°C), then cleaning, drying and reeling. This system is more efficient than the village system as it deals with large quantities and gives a uniform thread size. Such technology has its disadvantages however and in Perum Perhutani the problem is that machines are not put into use until there six tonnes of cocoons to process at one time. This means the only machines that get much use are those in Tajuncu, while the rest are unused. The Wajo branch workers tending to put their energy into the hand production of spun silk instead.<sup>5</sup>

---

<sup>5</sup> Some of those who work with silk in Sengkang refer to spun silk as 'samarinda'. Opinion on 'samarinda' differs as others say it is a thread produced like one in Samarinda (Kalimantan) and Informant X described it as a thread from China containing leaf extracts.





**FIGURE 17** *Farmers who produce excess silk cocoons can sell them to one of four branches of Perum Perhutani. Here large quantities can be reeled using Japanese machines.*



## THE SPINNING PROCESS

Cocoons which are damaged through extracting the silk worm pupa cannot be reeled as the filament is no longer a continuous strand. These cocoons are processed at Perum Perhutani sites and I observed the task at the Wajo branch where firstly the cocoons were heated, just like the intact cocoons. This loosens the sericin gum and also the filaments. This takes place in one of the Japanese designed machines and so large quantities can be dealt with at one time. The silk leaves this process with the soft texture we associate with silk, and when it has dried it is treated in a similar way to wool. The filaments become a 'cotton wool-like' mass which is hand teased and then spun using electric or foot powered spinning wheels (see figure 18). The final thread is soft and wool-like and in no way fine. Its size is so uneven that it is not used for delicate garments such as sarongs and *baju bodo*. Its uses are limited to dyeing and then weaving into jackets, curtains, mats and even pencil cases.





**FIGURE 18** *Cocoons that are cut (in order to remove the larva for breeding) no longer have a continuous silk filament. This silk has to be teased and spun like wool.*



## **MARKETING OF RAW MATERIALS**

Raw materials for the production of silk textiles include: silk thread, dyes, supplementary weft threads and starch. Although a large quantity of silk is locally produced, up to 60% is from Java or further afield (Informant 20). None of the other products are produced locally but these are easily available in Sengkang for textile producers, via the ports of Pare-Pare and Ujung Pandang.

### **RAW SILK**

Once the locally produced silk thread is reeled and twisted into neat hanks it is ready to be sold. There are two ways in which this raw silk can be sold. The first is for buyers to come to the well known silk producing villages. By coming directly the villages buyers build a more personal bond with a specific family or village increasing trust. The second and most common way is for villagers to take their produce to the twice-weekly local market at Salojampu (five kilometres south of Sengkang towards Soppeng). This market initially appears to be a typical Indonesian market but towards the back of the market is a raised area for silk sales (during the rainy season the market is muddy and in the dry season it is dusty, so the raised areas help to keep the expensive silk clean). There are stands for approximately fifteen sellers and they sit with their goods, including the Javanese silk which is softer, whiter and stronger than locally produced silk.

Prices vary a great deal due to the quality and availability of silk. In Canru village families would expect to sell one kilogram of local raw silk for up to Rp 75,000 (approximately £19) and the Javanese silk for about Rp 80,000 (approximately £21 (Informants 7 and 8).



## **DYES**

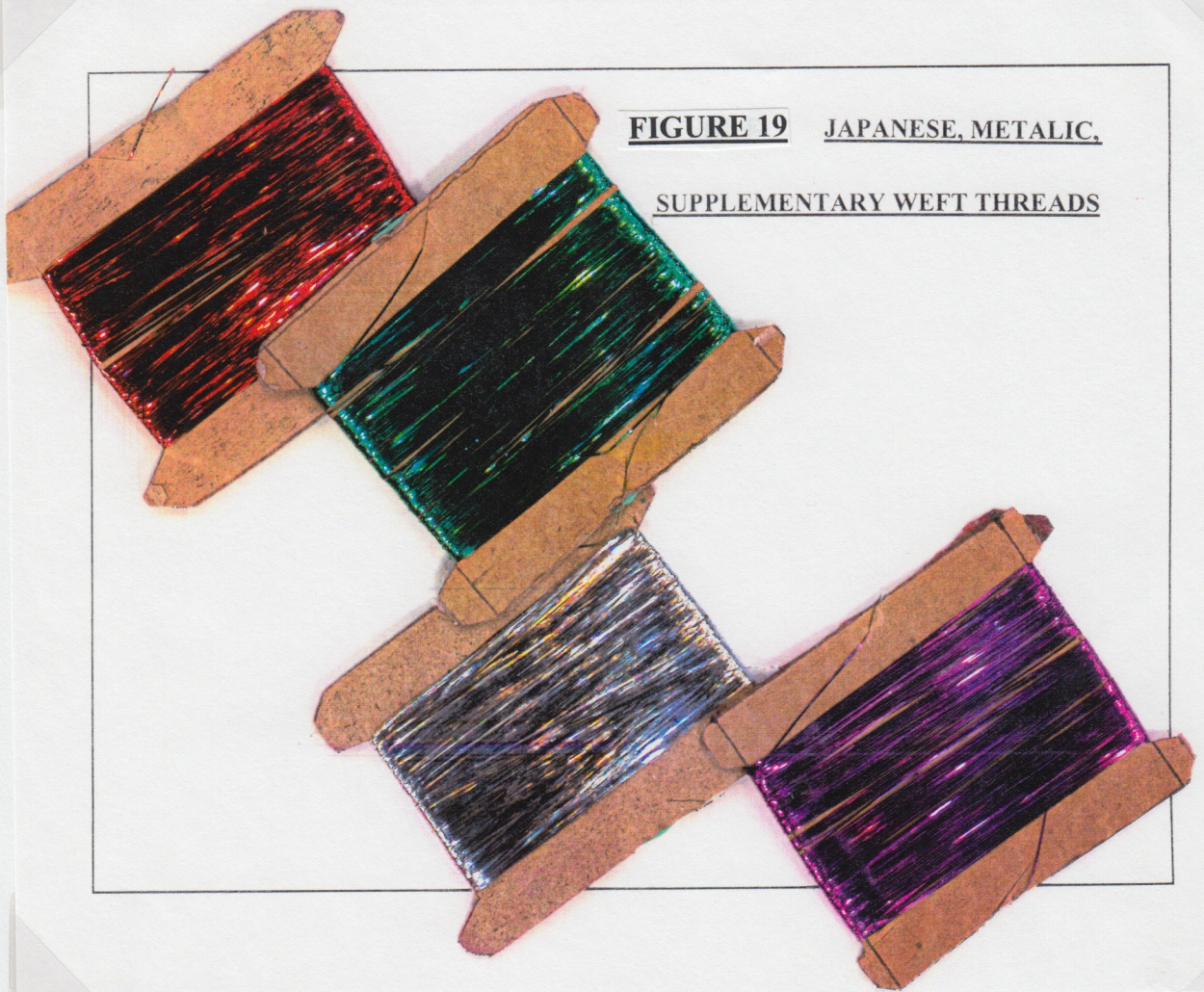
Aniline chemical dyes were introduced to the area in 1936 and have gradually replaced natural dyes. Chemical dyes are easier to use, and have the added advantage of producing bright, vibrant colours much loved by the Bugis people.

Stall holders at Salojampu market also have a wide range of dyes from Java and abroad. As weavers usually work with very little working capital they can buy small sachets of dye. These are weighed out on the spot and prices vary with quality. A blue German dye is the most expensive at Rp 2,500 (approximately 70p) for five grams, while Indonesian dyes are Rp 1,000 (approximately 20p) for five grams. This quantity is enough to dye one sarong. (Informant 37)

## **SUPPLEMENTARY WEFT THREAD**

Special threads that are added to certain designs simply for an aesthetic effect are known as supplementary weft threads. These are non-silk and are used for contrast and to create new weave designs. Metallic threads are of Japanese origin (see Figure 19). Stall holders in Salojampu buy these by the reel, then wind short lengths onto card for sale. There are a variety of colours and they are sold for Rp 100 (approximately 2.5p) a piece. This price allows those with the smallest working capital to add a unique touch to their weaving (Informant 37).





**FIGURE 19** JAPANESE, METALIC,  
SUPPLEMENTARY WEFT THREADS



## STARCH

Starch is also sold at the Salojampu market. This is necessary to strengthen threads before weaving and to toughen material. It is also bought in small quantities (made up by the seller) so that one can buy enough for immediate needs.

## FROM THREAD TO CLOTH

Once all the raw materials are purchased there are still several processes to go through to condition them for the loom. First the threads have to be prepared depending on whether the final cloth is to be plain, checked or bearing a complex design (see Figure 20 below).

| Silk Thread  |   |     |                 |  |
|--------------|---|-----|-----------------|--|
| A:Warp       |   |     | B:Weft          |  |
| Reeling      | 2 |     | Reeling         |  |
| Doubling     | 2 |     | Doubling        |  |
| Twisting     | 2 |     | Twisting        |  |
| Degumming    | 1 |     | Degumming       |  |
| Dyeing       | 1 | 2   | Reeling         |  |
| Reeling      | 2 | 1   | Tension Framing |  |
| Warping      | 1 | 3   | Tying           |  |
| Threading Up | 2 | 1/2 | Dyeing          |  |
|              |   | 1/2 | Untying         |  |
|              |   |     | Local Dying     |  |
|              |   |     | Washing         |  |
|              |   | 3   | Reeling         |  |
|              |   |     | Weaving         |  |
| CLOTH        |   |     |                 |  |

**FIGURE 20    Silk Thread Processing (and its time consumption in days)**

Source: Information from Departmen Perindustrian and Unit Pelayan Teknis Textil.



### **Reeling, Doubling, Twisting and Degumming**

Reeling, doubling and twisting are all carried out by machine and can be seen in semi-automated companies such as Unit Pelayan Teknis Textil in Impa-Impa village east of Sengkang on the road to Pare-Pare. Here the hanks of silk are wound onto the reels for manageability ('reeling'), then two threads are twined up ('doubling') and twisted to make the thread stronger. This thread is then heated at 80-90°C in a mixture of lake water, soap and soda to remove the sericin gum that held the cocoons solid - 'degumming' (Informant 20). This removes 20-25% of the silk's weight and improves its quality. The process takes up to one and a half hours for local thread or one hour for Javanese or foreign thread. After this the threads are rinsed and dried. If threads are over-heated or left too long they will weaken and may later break during weaving.

### **Dyeing**

The various dyeing techniques depend on the final product. For certain designs, such as the traditional weft ikat and checks, the threads are dyed and then woven. Other designs, such as the *pelangi* rainbow, batik and *baju bodo*, are woven first and dyed later. Both techniques follow the same basics and so will be detailed below with specific designs discussed later.

Today only chemical dyes are used and the German brands are considered to be the best quality. To dye one kilogram of silk requires 30 litres of water and 20-50 grams of dye. A 50% application requires 50g of dye and results in dark colours, while 20% and 30% give light and medium colours respectively. These dye baths are heated in drums over a fire for approximately one hour and as the use of fixing agents is rare, fabrics must later be treated with care, avoiding sunlight, sweat, ironing and washing. Those four factors cause fading of the colours and damage the silk filaments.



## The Warp Thread

The warp threads are mounted upon the loom, running along the length of the cloth and, at 21 denier, is the finer of the two sets of threads.<sup>6</sup> After dyeing, the warp is again reeled, because the threads are dyed in hanks and would become knotted if processed in that form. One hundred reels are needed for warping-up to be carried out effectively, and for a 110 centimetre width of cloth about 3600 threads are needed (see Appendix C for calculations). In Unit Pelayan Teknis Textil there are two machines that are semi-automated and carry out this task efficiently. In the village of Sempange there are also machines for this task but they are manually powered (see figure 21).

The hundred reels are mounted on a rack system and their threads run through a set of reeds onto the left side of a drum. The diameter of the drum is two metres, and so if it is turned 75 times it has 150 metres of thread around it (the usual length of a piece of silk cloth). The 100 threads from the reels take up about two centimetres on the drum and then are knotted off so that another 100m can be laid alongside. Once this is done 36 times there are 3600 threads on the drum. From here all the knots are untied and re-tied around the loom's removable warp beam. Simultaneously, all the threads are slowly wound onto the warp beam, with newspaper laid between the layers to keep the threads in order and at the correct tension. When the beam holds the entire length of threads it is transferred to the back of the loom (see figure 22) for threading-up.

Threading-up takes two days and is the slow process of dividing the threads into odd and even, threading them through the correct rack of heddles and leashes and then through the reed beater (see figure 23). The eye of each heddle/leash is about one centimetre long and holds one thread. In one centimetre of reed combs there are about 16 spaces and these should contain two threads each. At each side of the cloth an extra 20 threads are added. This makes the weave much closer and stronger, and helps the final cloth to hold its shape.

---

<sup>6</sup> Companies measure silk thread by its denier and weight. One denier is one filament. 9000 metres of 21 denier weights 21 grammes (Informant 20).

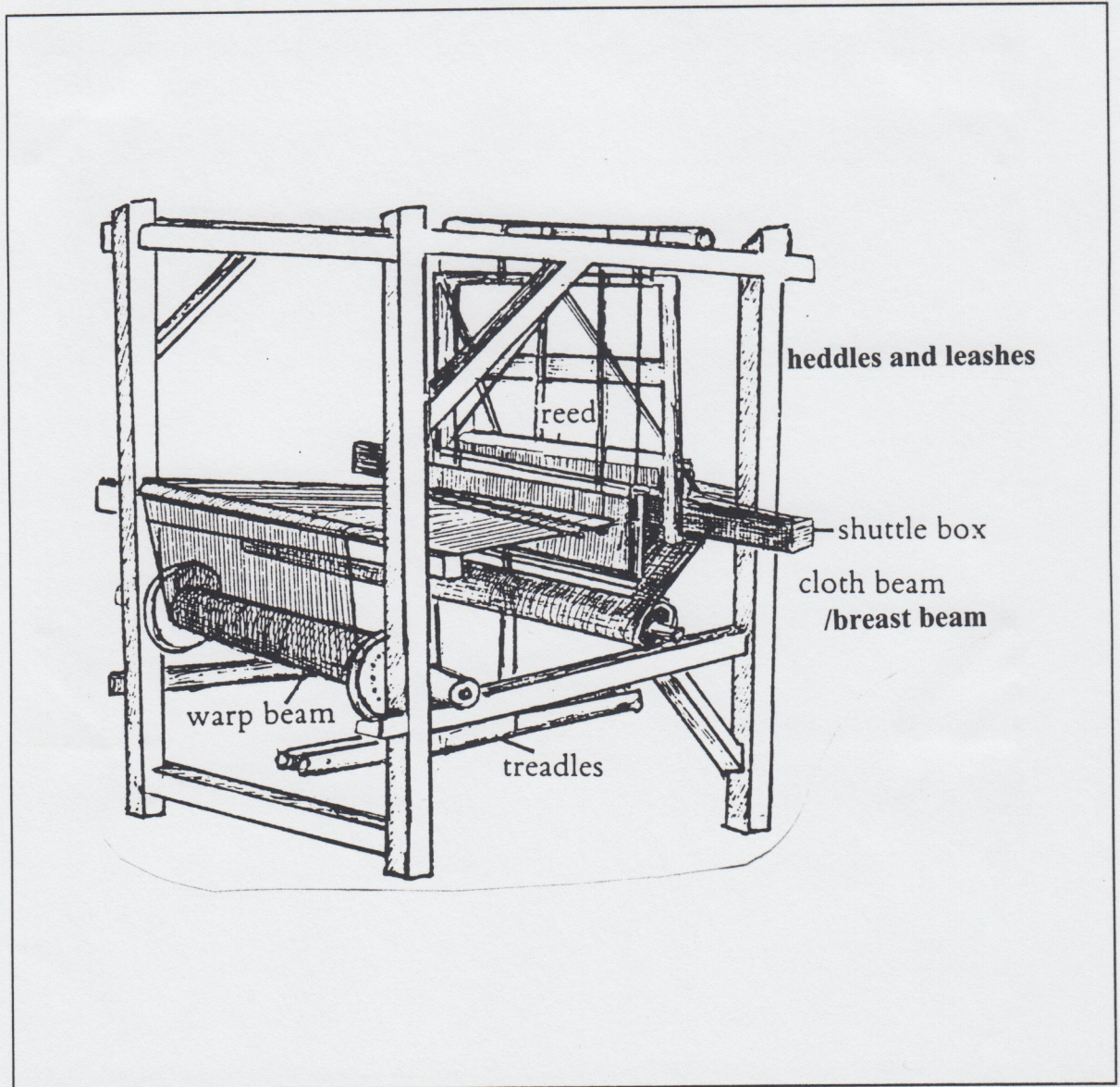




**FIGURE 21** *Warping-Up. Approximately 3600 warp threads will produce a one metre width of cloth. The second bar from the right will have 100m or 150m of thread wound on to it. Then it will be placed at the back of the loom with the threads running forward for weaving.*



**FIGURE22** ALAT TENUN BUKAN MESIN (ATBM) or  
NON-MOTORISED LOOM



*There are fifteen experts in the Sengkang area who make  
looms of a similar design to this.*

Source : Fraser-Lu (1988;39)





**FIGURE 23** *Threading up the loom. A two day process which includes separating the odd and even warp threads before weaving can begin.*



The threading-up process would be extremely tedious if it was carried out solely by hand. The *pisau cucuk* or threading knife (see Figure 24) was developed to speed up the process. The *pisau cucuk* can be threaded through each lease or comb space. A thread is then laid in the hook and pulled back through. Even with the knife the process is a time consuming task, but once it is done and the threads are attached to the breast beam, the loom is ready for weaving.

### **The Weft Thread and Weaving**

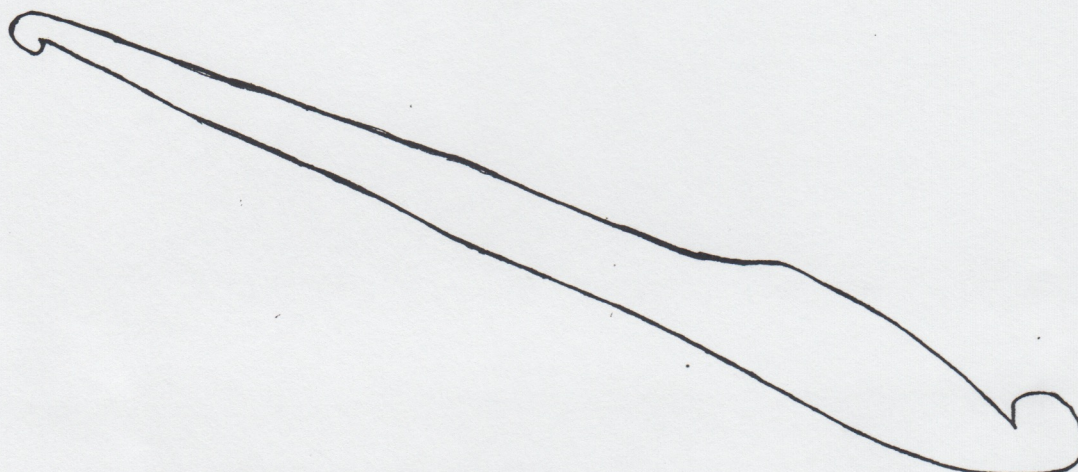
The weft thread runs widthways across the loom and cloth. At 40 denier it is the stronger of the two threads and this is so that it will stand the force of 'flying' across the loom inside the shuttle. In Sengkang it is the weft thread that indicates the cloth's pattern.

After dyeing, the weft thread is washed, dried and wound on to spools of bamboo. When needed, these spools are inserted and threaded into the loom's shuttles, where three holes act as breaks to maintain tension while weaving. The shuttles are placed in one of the shuttle boxes and when the reed beater is pushed away from the weaver, a string mechanism induces the shuttle to 'fly' through the warp threads to the opposite shuttle box. As each weft thread is laid the reeds are pulled back, beating the weft thread into line, and the treadles are changed, raising the alternate heddle sets and creating the 'shed' or 'counter-shed' for the next weft thread to pass through. As row upon row of weft threads are added, the cloth builds up and is wound onto the breast beam, while more thread is released from the warp beam. Depending on the design, between one and five metres of cloth can be woven in one day on each loom. It is important that the cloth is woven by one person in order to maintain an even tension on the cloth (Mastang 1991;33).



**FIGURE 24**

**PISAU CUCUK or THREADING KNIFE**



Made from an old aluminium spoon.



## DESIGNS

In Sengkang various designs are used in silk weaving, with new ideas and technology being introduced continually. The range of designs that can be seen today are divided between the traditional, which are established as local designs and have been mentioned in the work of other researchers in the field, and the modern, which are experimental or have appeared in the last five years.

### **The Check Design**

*Kotak-kotak*, or the check design, is the easiest weave and has been used in designs since the beginning of silk weaving in Sengkang. The design was used due to its popularity in the earlier cotton industry. The design entails a great deal of concentration during warping up, as the threads must be in even stripes of colour and as weaving begins the weaver will have several shuttles of different coloured threads at hand. As the cloth is woven, *kotak* (squares) are built up and measured. The weft thread is then changed to build up squares of a new colour (see Figure 25). Large squares and small squares are the traditional designs for sarongs. Checks are still popular today but the design tends to be associated with men and older women. To modernise them the check is often outlined by gold or silver supplementary weft threads.

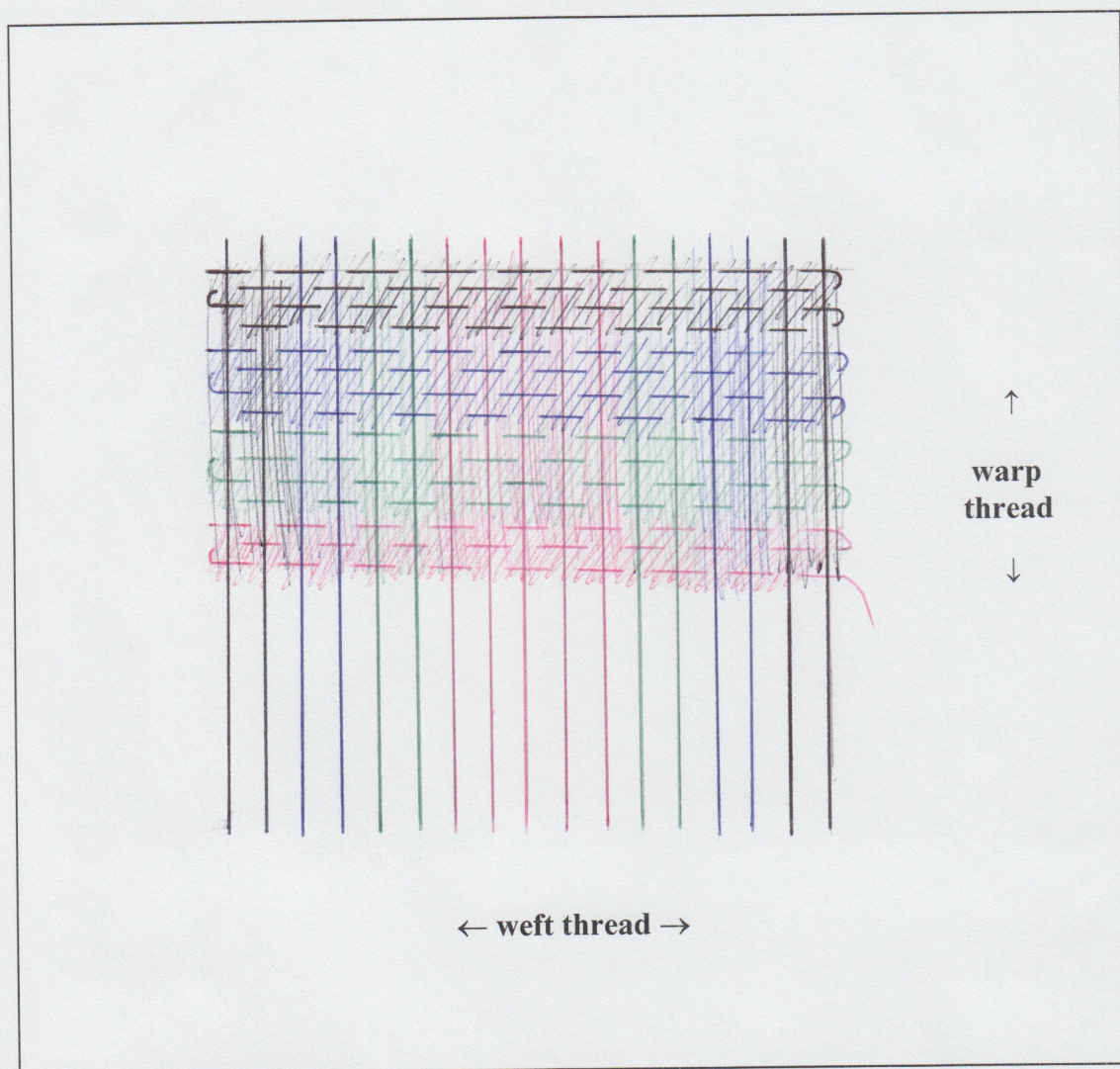
The check is a basic design but it is one for which the area is famous and experts argue that there is meaning behind the weave. Zerner (1982;53) believes that the traditional check sarongs had two parts; the design and the head. Within the head was a wide stripe, and these components he believes, were like a map of the old kingdom. Depicted within the design was the leader, his nobles and the out-lying villages. Morrell (1996) argues that these check designs reflect the Bugis belief in *sulapa eppa*, or four sides, as well as being of good Islamic design as it does not depict living objects. She explains that many worldly and non-worldly aspects of Bugis life are considered to have four elements and a square based design reflects this belief. The design symbolism also illustrates the Bugis striving for balance and stability in



society. I am inclined to believe that there may be a simpler explanation for the presence of this design. The check design may be compatible with the Bugis *sulappa eppa* and it may be likened to a map, but primarily it is the easiest weave to produce with narrow but effective variations. Morrell (1996) admits that weavers are not likely to realise the symbolism buried in their weaving. This may be because it is 'subconscious symbolism' or because more demanding designs have been introduced. Yet if the check design held no meaning for the Bugis weavers surely it would have been completely abandoned for more eye-catching designs? This indicates that the design may have a deeper relevance at a sub-conscious level.



**FIGURE 25   HOW TO WEAWE A CHECK DESIGN**



*Even blocks of colour are built-up as weft threads  
are changed at regular intervals*



- *Baju Bodo*

*Baju Bodo* is the name of the traditional Bugis women's blouse. These blouses can be woven of various threads, including silk (see figure 26). They are paper thin, have a simple square design and a starched, puffed shape. Although they may no longer be a part of every woman's wardrobe, they are still an important part of Bugis cultural heritage. These blouses are worn by girls when presenting wedding invitations and receiving wedding guests. They are a solid block of colour, which complement the coloured silk sarong (Crystal 1979, 54), and can be hired from a number of salons in Sengkang.

Traditionally very bright colours (especially red and pink) and translucent cloths were reserved for young girls, while darker colours and black in opaque weaves were for the older women. These days such norms are not adhered to, but groups of girls receiving guests at a wedding can be identified as they wear matching colours of *baju bodo*.





**FIGURE 26**      *'Baju Bodo', the traditional Bugis |women's blouse.  
It is woven in fine white silk and then dyed, starched and stretched  
in the sun to dry.*



- *Samarinda*

There is a great deal of ambiguity over what constitutes *samarinda*. Some say it is another name for spun silk (Informant 20), whilst others say it is the name given to one of the flower designs printed on imported silk (Zerner 1982;47). One informant was insistent that *samarinda* is a Chinese thread made with leaves, but the *samrinda* that I will look at now is a complex design brought from the city of Samarinda in Kalimantan. The design is usually in hues of blue or purple and made up of inter-linking circles, squares and stripes (see figure 27). The weaving is very time consuming as each weft thread has to be laid in exactly the right place to give a crisp definition to each shape. The cloth is produced in small quantities and is very expensive because of its time consuming production. Only by searching carefully in the silk weaving villages can this design be found on the loom and it is unlikely that one will be able to see the dyeing, warping-up and reeling processes.





**FIGURE 27** *An array of colours and designs: silk sarongs on sale at Amina Akil Silk. Descriptions from left to right;*

*A. a 50 year old piece woven by the owner's mother-in-law when she was a young girl.*

*B. and C. Sarongs bearing the name 'Amina Akil' - a sign of quality from the family who introduced weaving to a village just outside Sengkang.*

*D. Samarinda - a weave and design based on techniques taken from Samarinda, Kalimantan.*

*E. and F. Two modern sarongs. The darker is thought to be more appropriate for older women because of its sober colouring.*



### • Thread Tie Dye

Many of Sengkang's colourful and eye-catching designs are from ikat (Malay meaning tie or wrap) dyeing of threads before they are woven. Although it is possible to tie dye the warp thread and weave it with a plain or patterned weft, the Sengkang tradition is to use a plain coloured warp and then add the patterned weft. This is called weft thread ikat and is found in many Islamic areas throughout Indonesia, associating it with groups who had contact with early Muslim traders (Indonesian Arts Society 1976;11). The Islamic influence demands that the designs depict no living objects and this is usually observed in older designs. The modern designs often ignore this precept and reproduce attractive designs containing various flowers. The modern weft thread decorations are from eastern Indonesia and are thought to have arrived in the 1930s (Zerner 1982;51). The terms for them are ikat and *cetak* (meaning print).

To begin the weft thread designs, the silk must be prepared. This entails threads being wound from their reels onto a frame measuring one metre in width, the same width as the intended cloth (see figure 28). Forty to sixty bands of thread can be laid across a frame, each band consisting of up to 100 threads, ten metres in length. Each frame can hold 60,000m of thread and by being laid out systematically, threads can be bound in the patterns as they will when they are woven. Threads are then removed from the frame for dyeing.

Griya Sutera and Haji Mustakim are showroom workshops in Sengkang which produce large quantities of silk cloth. Here the framed weft threads are wrapped in plastic ties to cover the areas to remain undyed. Threads are then removed from the frame for dyeing, drying and cutting open the ikat ties. The areas left white are then painted with lighter/brighter colours to give the desired result, a multi-coloured thread. In Griya Sutera the tool for painting is a fine bamboo stick covered at one end by foam rubber. The foam rubber is soaked in dye and then daubed on the appropriate sections of thread.





**FIGURE 28** *Putting the weft thread on a frame.  
The frame is the same width as the cloth will be, so any patterns  
can be woven in accurately.*



The *cetak* technique can be found in Wage village and the designs often depict waves and mountains, '*bombak*' (see figure 29), or flowers, '*bunga*' (see Figure 30).<sup>7</sup> Several houses in Wage have *cetak* artists and women who carry out thread painting (where I was able to observe the process and learn a little about the popular colours and motifs). The *cetak* design involves a light illustration of the design being painted on the threads. This has to be done precisely and is usually the task of an older, more experienced woman. Later younger girls fill in the colours and embolden the pattern (see figure 31). The tools of the craft are made from bamboo and thread. Different widths of bamboo will give different widths of colour and are bound at one end with cotton threads. As the silk threads are rubbed they take up the dye from the cotton. It takes at least one hour to paint one frame of thread, and the same time again to dry in the sun, before the day-long task of ikat wrapping the threads (see figures 32 and 33). Plastic ties enclose the design so that any mistakes will be coloured in the dye bath, while the flower or zigzag designs are preserved inside.

Weaving an ikat or *cetak* is more complex than any other design because as each weft thread is laid the weaver must check its position before laying the next. If the threads are laid out of line the design will appear distorted. Not suprisingly therefore, on average two metres of the weft ikat cloth can be woven per day.

---

<sup>7</sup> Both Fraser-Lu (1988) and Zerner (1982) refer to this as *sarung samarinda* although the people of Sengkang do not.





**FIGURE 29** *Weaving*  
*With a weft thread 'ikat' design up to two metres of cloth can be woven per day*





**FIGURE 30**      *The loom and weaving.*  
*Depicted here is another popular Bugis design,*  
*the 'bunga' or flower design.*





**FIGURE 31**      *West thread painting.*  
*This classic 'bombak' or waves design is one of Sengkang's most famous.*  
*It is said to resemble the hills and waves of Tempe Lake.*





**FIGURE 32**

*Frames of painted weft threads drying in the sun.*





**FIGURE 33** *Ikat is very time consuming and will take a whole day's work. It blocks selected areas of thread from dye penetration and is a very popular dyeing technique throughout Indonesia.*

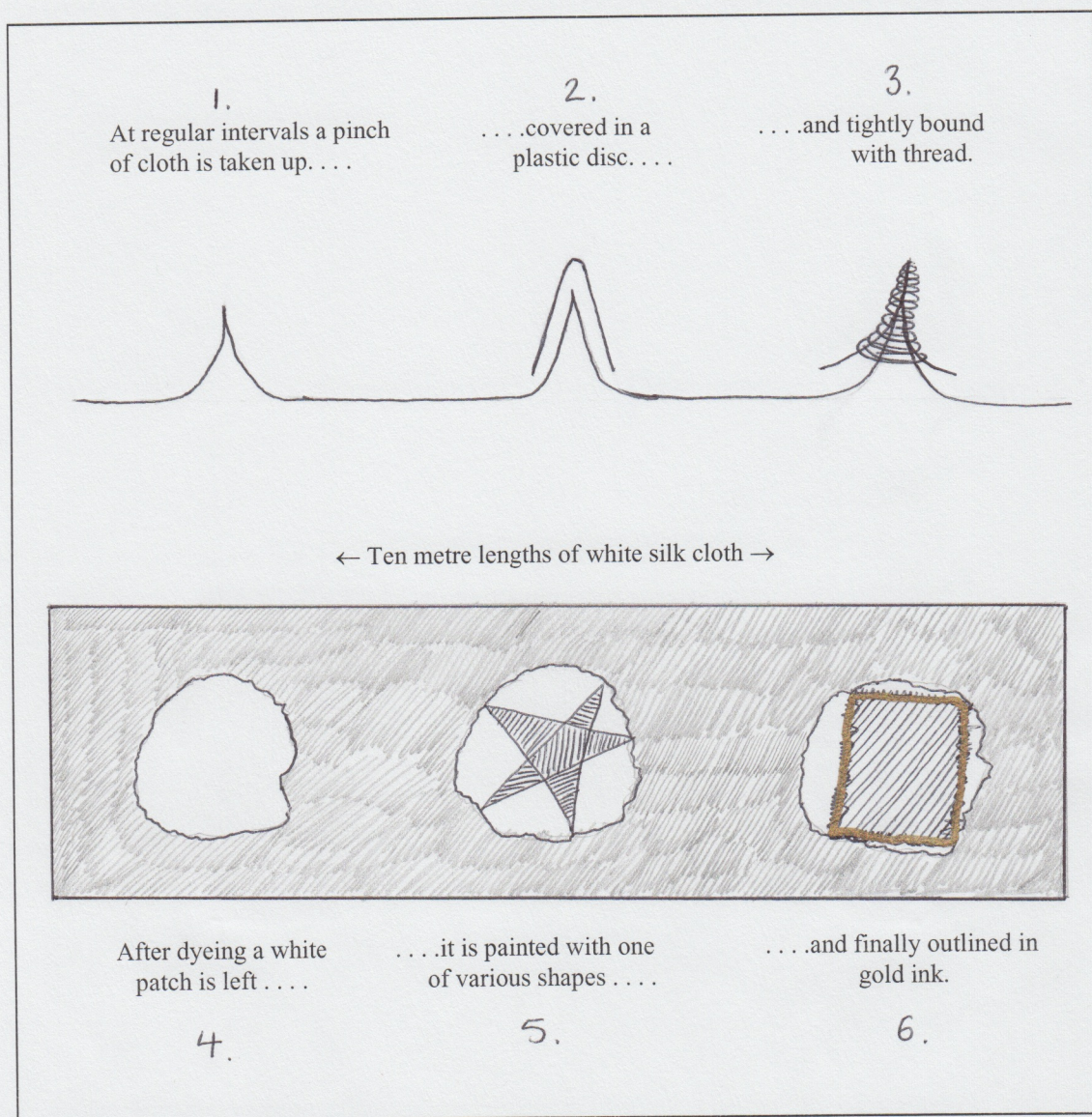


### Cloth Tie Dye

In recent years new designs have been introduced and tried. Two of these are detailed below and while one is still simply at the experimental stage the other has proved successful. These two new designs both use lengths of plain white cloth measuring 10m in length. Weaving white cloth is very simple in comparison to weaving a design. The first technique is un-named and produced on a very small scale at Amin Akil in Sempang. The final effect looks rather like a leopard skin and it is produced in the following way. The cloth is concertinated lengthways with a one centimetre depth. The zigzag of the cloth is like that of a fan and to hold it in shape threads are passed through at regular intervals. When pulled tight the threads gather the 10m into 30cm and at this point they are tied before entering the dye bath. Areas that are held compact by the thread remain white, while the outer areas that were fully exposed to the dye have taken up the colouring. The dark areas fade into the light areas as the dye seeped into less compressed areas.

The second technique is called *pelangi*, meaning rainbow and is a traditional East Sumatran design (Informant 48) introduced to the area about four years ago. *Pelangi* is produced by tying small circular areas of cloth and takes place at the showroom workshop of Sumber Sutera in Sengkang. 'Pinches' of cloth are taken and bound at regular intervals with a plastic disc and thread (see Figure 34). When dyed the area inside the disc and binding will be white with a little seepage from the dye like traditional 'tie-dyeing'. This gives a blending effect between the two colours but leaves a vaguely circular pattern. The next part of the process fills the white areas with vivid hand painted shapes, such as squares and circles, in bright colours. Then comes the Sumber Sutera signature, a hand drawn outline in gold ink using a *canting*, or batik pen (see figure 35).





**FIGURE 34   HOW TO CREATE THE 'PELANGI' DESIGN**





**FIGURE 35** *Sumber Sutura is a showroom in Sengkang. Its designs are based on a plain white weave, 'pelangi' or rainbow tie dye and gold paint motifs.*



### Batik

This is the newest process to be found in Sengkang at Griya Sutura and utilises Javanese batik techniques. Lengths of white silk are first given pencil designs by skilled artists. These are then re-traced using the *canting*, or wax pen, filled with hot wax from a *wok* on a mini stove. The waxed areas will remain white, resisting the dyes. Light colours are initially painted in and enclosed by wax, then darker colours, until the design is complete (see figure 36). To remove the wax and reveal the design below, the cloth is boiled.

At the time of fieldwork, this project had been running only one month and it was not possible to measure its success. However a combination of the luxury of silk, bright colours and a popular Javanese batik is likely to be a local, and perhaps national, success. It also reflects the Bugis willingness to adapt ideas and expand where and when changes and growing markets demand it.





**FIGURE 36** *Griya Sutura is a showroom on the outskirts of Sengkang. The new and experimental design is using Javanese batik techniques on silk.*



## THE MARKETING OF FINISHED PRODUCTS

Silk is an important commodity in Sengkang both economically and socially. Many people are involved in its production and even more are maintaining local tradition by using silk clothing for various celebrations. In some ways the role of the silk is expanding as increasing numbers of tourists visit the area to watch the processes involved, and the prices of various silk items now make them accessible to the local population. Previously, silk sarongs were reserved for royalty and nobility, whilst now they can be found in the vast majority of Bugis homes. Not only is the sarong is popular, but so are a whole host of accessories such as bags, fans, ties, scarves, table cloths and wall hangings. The fact that silk has become more affordable means that demand has grown too.

Sengkang is now famous in Sulawesi and the silks can be found throughout the Indonesian archipelago. Numerous showrooms and market stalls in Sengkang sell a huge variety of designs to local and foreign customers. There are even souvenir shops and markets in Ujung Pandang (South Sulawesi's capital) which stock the Sengkang produced goods. In Sengkang itself the cost of one metre of weft ikat silk sells for around Rp 20,000 (approximately £5.25) while the *pelangi* is around Rp 35,000 (approximately £9.25) per metre. Sellers insist that anything cheaper is not pure silk and outside the area prices begin to rise steeply.

Tourism in South Sulawesi has been growing since the 1970s, as it has throughout Indonesia, and this has given the product market a real boost. Today many more tourists are coming to visit Lake Tempe and the silk processing on their way to the highlands or Tana Toraja. The natural thing to do is to buy a piece of silk as a souvenir from the area, even if the locally admired designs are not to the outsider's tastes.

As it is one of only a couple silk producing areas in Indonesia, Sengkang is known nationally. This may be partly due to the introduction of the *ATBM* loom, and the increase in number of businesses rather than home-based, individual workers.



available on a wider national market (Mastang 1991;43). Silk sarongs are the popular products to export throughout the archipelago, with the majority going to Java. With



bright colours and bold designs being to the taste of most Indonesians including the Bugis, it is not surprising that the designs are becoming popular throughout the archipelago.

Due to the growing popularity of silk items, sales are likely to continue expanding at a local level. At international level the market is not enjoying such success. At present the international market is that which Sengkang's showrooms and local government are aiming for (Informant 20), yet there are restricting factors that are holding back such expansion. The first factor is that production in the area is on a relatively small scale and thus it is doubtful whether the industry today could satisfy international export demands (Informant 20). Secondly, the colours and designs may not be compatible with an international market. The Bugis like bright colours and garish designs which do not always suit the tastes of westerners. To be more acceptable these would have to be toned down and adapted. Traditional designs may also have to be sacrificed in order to accommodate outside requirements. Locals may even end up producing cloth that they themselves do not like. Thirdly the quality of the silk and dyes is neither high nor uniform. The silk is not soft like that of Thailand and the colours are likely to fade through daily usage and exposure to light and washing.

The local demand for Sengkang silk is not likely to decrease because its social and cultural role in Bugis life is firmly established. The use of silk at weddings and other ceremonies has increased because of its more affordable prices and this trend is likely to continue. Although traditional silk clothing is not likely to be worn on a daily basis, for special occasions its future looks stable. The desired international markets are likely to be much more of a challenge, but one that can be overcome if the industry concentrates its energies that way.

This chapter has detailed the processing techniques used in Sengkang's silk production from beginning to end, from the silk worm stage to the final cloth. Now the next chapter will look at the impact of recent developments, the industry's possible future and the conclusion to this study.



## CHAPTER FOUR

### CONCLUSION

In the preceding chapters the history of Sengkang's silk industry has been traced to a mysterious past that links South Sulawesi with China and other parts of South-East Asia. Also the present day process has been examined and the role of silk cloth has been described. This chapter will look at what the future may hold for the area and its silk industry and conclude the project.

To date, the silk industry and market has been a success, despite a few initial troubles. It now dominates the economy in the Sengkang area. This has been due to both local and government support, tourism since the 1970s and the export market in the 1980s. These factors have succeeded in confirming the silk industry as a part of the Sengkang culture. With government influences such as the setting up of the laboratory in Tajuncu, the introduction of *ATBM* looms and the promotion as *Kota Sutura* (silk city) it is rather a 'created culture' or one that is not entirely native to the Sengkang people. Yet, items such as the silk sarong and the *baju bodo* have continued ceremonial importance in Bugis tradition and their production is not likely to die out (see figure 37). These items are as established as the white wedding dress in western Christian cultures and their use in this context guarantees a continued local demand for silk. It does not offer scope for expansion in the market, as local sales are limited, but it does offer a certain continuity and security for production. Crafts and marketing are not of a static nature and the silk industry is likely to continue its path of evolution. So what is likely to change ?

At present the Tajuncu laboratory is up to date and production is in keeping with local demands . If these demands increase, perhaps with a national and international market developing, the laboratory may have to expand too. In the villages, silkworm raising is carried out in an adequate fashion, but techniques are basic. These may have to be modernised and made more uniform if markets expand. New machines would give better results and would be less labour intensive. As silkworm raising is quite profitable the farmers would find equipment affordable.





**FIGURE 37** *Silk sarongs are very acceptable formal wear for wedding guests.*



In the past silk farming was carried out on a 'cottage industry' level, but now the growing trend is towards small companies. The company system is more profitable to both employers and employees and production is greater and of a higher quality. The increase in small companies is likely to continue as farmers and cloth producers use their profits as capital for such future investments. This will gradually take women out of the home environment and destroy the home based industry of present (which is contrary to one of the government's original aims). It will also affect the tourist industry that is at present growing. At the moment visitors enjoy seeing the village setting behind the traditional craft and that will decline if town based companies take over. The craft aspects of production are likely to remain a woman's role as they are considered more creative and gentle; the necessary traits for the occupation.

Also on a local scale is the tourist market. This is likely to continue and possibly expand, as Sengkang is ideally situated not far from the road linking Tana Toraja to Ujung Pandang. Tourists like to see the silk processing and often buy souvenirs of locally woven cloth. Souvenir style products give showrooms the opportunity to experiment and this can be seen through the emergence of products such as woven cards and painted scarves in the Sempang showroom.

It does seem that the national and international markets are rather neglected, but if this was a government concern it would probably change with relative speed. This is unlikely to occur and it will be for local entrepreneurs to realise the potential.

It should be no great task to promote the silk sarong and other products, such as bags, cases and fans, on a national level because it is a luxury item and the colours and designs are such that most Indonesians would find them attractive. Bright and vibrant colours are much loved by women through-out the Indonesian archipelago.

The international level of marketing will be much harder to enter, but financially worth pursuing. To be acceptable on this market the following changes would have to be executed. Firstly a higher quality thread would have to be produced in order to



produce cloth that is as soft as that found in Thailand and other regions. Secondly colours would have to be modified to suit the foreigners' taste.

Finally the dyes and dyeing techniques would have to be adapted making them more wash and fade resistant. The risk in carrying out these modifications, for the sake of the tourist and international market, is that local traditions and designs will be sacrificed. Care should be taken to guard against this as it has the possibility of damaging an industry that is socially, culturally and economically important to Sengkang.

This project has been a thorough assessment of Sengkang and its silk industry. The work that contained within could be considered solid ground work for continuing research in the area. The subject could be further developed by research into the following areas. Firstly, further analysis into historical texts such as the *I La Galigo* and *Lontaraq* for references to silk cloths and the origins of the Sengkang silk industry. Secondly, theoretical issues concerning; textile links with India, China and Eastern Indonesia, the Islamic influence on designs, investigation into the early dye techniques, Bugis folk tales containing reference to silk, gender roles, symbolism in the designs, traditions and tradition maintenance, the government's role and future developments, all of which could prove valid and interesting additions to the body of knowledge in this project.

An innovative way to protect the old designs, illustrate the industry to tourists (and interested businesses) and encourage further research would be to set up a museum in Sengkang itself. Such a project would bring together local showrooms and individual workers. A museum could actively illustrate the processes that take place in the villages so that visitors could understand more when visiting the villages. Techniques that are or may be dying out, such as *gedogan* looms and present designs, could also be illustrated and their existence preserved. The final function of a working museum could be to further promote Sengkang as the centre of silk production and *Kota Sutura*.



## **BIBLIOGRAPHY**

### **Part A : Works cited.**

American Fabrics Magazine. 1972. *Encyclopedia of Textiles*. USA: Doric Publishing Co.

Brown, Roxanna. 1988. *The ceramics of Southeast Asia: Their dating and identification*. Singapore: Oxford University Press.

Crystal, Eric. 1979. 'Mountain Ikats and Coastal Silks; Traditional Textiles In South Sulawesi', in Joseph Fisher, ed., *Threads Of Tradition; Textiles of Indonesia and Sarawak*. Berkeley, California: Lowie Museum of Anthropology.

Echols, John.E and Hasan Shadily. 1989. *An Indonesian English Dictionary*. Ithaca and London : Cornell University Press.

Fraser-Lu, Sylvia. 1988. *Handwoven textiles of South-East Asia*. Singapore: Oxford University Press.

Gervaise, Nicolas. 1701. *An historical description of the kindom of Macassar in the East Indies*. London: n.p.

Hitchcock, Michael. 1991. *Indonesian Textiles*. Berkeley, California: Periplus Editions.

Indonesian Arts Society. 1976. *Textiles of Indonesia; An introductory handbook*. Jakarta : n.p.

Kern, R.A. 1939. *I La Galigo. Catalogus der Boegineesche, tot den I La Galigo-cyclus behoorende handschriften bewaard in het Legatum Warneranium te Leiden alsmede in andere Europeesche bibliotheken*. Lieden : Legatum Warneranium and Koninklijk Institute voor Taal-, Landen Volkenkunde.

Mastang, ST. 1991. *Skripsi; Pengrajin sarung sutra di kabupaten Wajo (suatu tinjauan historis) 1932-80*. Ujung Pandang: Universitas Hasanuddin.

Matthes, B.F. 1875. *Kort verslag aangaande alle mij in Europa bekende Makassaarsche en Boeginesche handschriften, vooral die van hat Nederlandsch Bijbelgenootschap te Amsterdam*. Amsterdam: Nederlandsch Bijbelgenootschap.

Maxwell, Robyn. 1990. *Textiles of South-East Asia; Tradition, trade and transformation*. Canberra: Australian National Gallery.



Morrell, Elizabeth. 1996. *Symbolism, spaciality and social order*. Paper to the International seminar on South Sulawesi history and culture. Ujung Pandang, Indonesia: n.p.

Pelras, Christian. 1996. *The Bugis*. Oxford: Blackwell.

Zerner, Charles. 1982. 'Silks from Southern Sulawesi' *Orientations* 13 (2) pp.46-55.

**Part B : Works consulted but not cited.**

American Home Economics Association. 1960. *Textile Handbook*. Washington DC: n.p.

Anonymous. 1970. *Propinsi Sulawesi Selatan; memperkenalkan daerah kabupaten Wadjo sebagai pusat industri kain sutra Sengkang*. Indonesia: Pertiwi Tjab. Wadjo.

Anonymous. 1971. *Propinsi Sulawesi Selatan; memperkenalkan daerah kabupaten Wadjo sebagai pusat industri kain sutra Sengkang*. Indonesia: Pertiwi Tjab. Wadjo.

Anonymous. 1971. *Hasil-hasil rapat badan musaurarah persuteraan alam nasional kedua*. Bogor, Indonesia: n.p.

Anonymous. 1996. *Siklas perumum perhutani kesatuan pengusahaan sutera alam Sulawesi Selatan*. Soppeng, Indonesia: Perum Perhutani.

Daud, H.Moh.Riri Amin. 1963. *Rentjana kerdja kegiatan usaha persutraan daerah di wilajah sutra Sulawesi Selatan*. Makassar, Indonesia:n.p.

Dowling, David and Beverly Hooper. 1996. *Contemporary Asia; a research guide*. Australia: University of Western Australia.

Emery, Irene. 1966. *The primary structures of fabrics; An illustrated classification*. Washington DC: The Textile Museum.

Gillow, John. 1992. *Traditional Indonesian textiles*. London: Thames and Hudson Ltd.

Gittinger, Matiebelle. 1985. *Splendid symbols; textiles and tradition in Indonesia*. Oxford: Oxford University Press.

Gittinger, Matiebelle. 1987. *To speak with cloth; Studies in Indonesian textiles*. Los Angeles: University of California, Museum of Cultural History.

Gittinger, Matiebelle. 1992. *Textiles and the Tai experience in South-East Asia*. Washington DC: Textile Museum.



Hitchcock, Michael. 1985. *Indonesian textile techniques*. Buckinghamshire: Shire Publications Ltd

Holmgren Spertus, Anita et al. 1977. *Celebes in Textile Traditions of Indonesia*. USA: Los Angeles County Museum of Art.

Jabba, Dammar. 1986. *Perkembangan tenun tradisional di kabupaten Wajo*. Sengkang: n.p.

Langewis, Laurens and Fritz A. Wagner. 1964. *Decorative Art in Indonesian Textiles*. Amsterdam: CPJ van der Deet.

Moerdoko, Wibowo. n.d. *Product development untuk menunjang pemasaran sutera alam Indonesia*. Bandung, Indonesia: Sutera Alam, Institute Teknologi Tekstil.

Monier-Williams, Sir.M. 1976. *Sanskrit manual (enlarged)*. Delhi: Ajanta Books International.

Muddariah, Andi Bau. 1971. *Report "Laporan inventarisasi dan evaluasi; persuteraan alam th. 1971 di Sengkang"*. Sengkang: n.p.

Palmer, Ingrid, 1964. *The Indonesian textile industry*. n.p: Ingrid Palmer

Puspitasari, E. 1965. *Persuteraan; pemeliharaan ulat sutera*. Jakarta: PN Balai Pustaka.

Solyom, Bronwen and Garrett. 1973. *Textiles of the Indonesian Archipelago*. Honolulu: University Press of Hawaii.

Sapada, Andi Nurhani. 1977. *Tradition Textiles of South Sulawesi*. In a paper to Wastraprema (Society of the friends of textiles). Jakarta: n.p.

Susanto, Sewan. n.d. *Pengolahan Sutera; dari cocoon sampai barang djadi*. Indonesia: n.p.

Volkman, T.A and Ian Caldwell, eds. 1990. *Sulawesi: The Celebes*. Berkeley: Periplus.

Warming, Wanda and Michael Gaworski. 1981. *The World of Indonesian Textiles*. London: Serindia.

Widjaja, Teguh and Ir.R.Soediarso Warsopranoto. 1970. *Laporan; pengembangan dan pembinaan persuteraan alam di Indonesia Umumnya dan Sulawesi Selatan khususnya*. Indonesia: Lembaga Persuteraan Alam.



## APPENDIX A

### INTERVIEWS\*

(All interviews conducted in Bahasa Indonesia unless otherwise stated.)

#### Informant No.

1. 4.11.96a and 13.12.96 Male, 25, Local Guide, Fort Rotterdam, Ujung Pandang  
Well informed about tourism and industries in Ujung Pandang.<sup>1</sup>
2. 4.11.96b Female, 30+, Weaver at C.V.Sutera Alam, Ujung Pandang
3. 4.11.96c Female, 25+, Silk Thread Processer at C.V.Sutera Alam
4. 4.11.96 - 15.12.96 Female, 25+, PhD student from New Zealand with  
interets in small scale industries of Ujung Pandang and surrounding area.<sup>1</sup>
5. 5.11.96 Male, 35+, Civil Servant, Departmen Perindustrian, Ujung  
Pandang. Handled statistics concerning silk production in Kabupaten Wajo
6. 6.11.96 - 23.12.96 Male, 29, Local Guide, Pondok Eka, Sengkang.  
Well informed about Senkang history, Bugis culture and local silk production.<sup>1</sup>
7. 7.11.96a Female, 40+, Silk Worm Farmer, Desa Canru  
Well established as a silk worm farmer, knew a little history, had own  
mulberry plantation.
8. 7.11.96b and 29.11.96 Male, 30+, Silk Worm Farmer, Desa Canru  
Well established as a silk worm farmer, knew a little history, had own  
mulberry plantation.
9. 7.11.96c and 29.11.96 Female, 30+, Silk Farmer and Reeler  
Wife to the above No.8

---

\* All ages are estimated.

<sup>1</sup> Conducted in English



10. 7.11.96d Female, 30+, Perumum Perhutani Worker, Sabbangparu  
Occupation - teasing broken cocoons in to silk thread
11. 7.11.96e Male, 30+, Perumum Perhutani Official, Sabbangparu  
Occupation - production management
12. 8.11.96a Female, 20+, Showroom Assistant, Haji Mustaquim, Sengkang
13. 8.11.96b Female, 20, Weaver, Haji Mustaquim, Sengkang  
Warping up at time of interview
14. 13.11.96a Male, 30+, From a Weaving House hold, Sempange  
Warping up at time of interview
15. 13.11.96b Female, 30+, Cloth Weaver, Sempange
16. 13.11.96c Male, 25+, Silk Dyer, Sempange
17. 13.11.96d Female, 20+, Sarong Weaver, Sempange
18. 13.11.96e, 14.11.96, 27.11.96 and 24.12.96 Female, 35, Prosperous  
Showroom Owner, Sempange  
Her family brought weaving techniques from Samarinda (Kalimantan) to  
Sempange, three generations ago.<sup>2</sup>
19. 13.11.96f Female, 20, Weft Thread Paint Designer, Tampangeng
20. 14.11.96a Male, 35, Civil Servant at Unit Pelayanan Teknis Textil,  
Sempange. A geography graduate now an expert in silk processing
21. 14.11.96b Male, 25+, Thread Dyer, Sempange  
Straightening dyed threads at interview, to facilitate weaving.

---

<sup>2</sup> Conducted in Indonesian and English



22. 15.11.96a Female, 30, Showroom Assistant, Sinar Sutera, Sengkang
23. 15.11.96b Male, 18+, Showroom Assistant, Sumber Sutera, Sengkang
24. 15.11.96c Male, 20, Silk Cloth Painter, Sumber Sutera, Sengkang
25. 15.11.96d Female, 20, Silk Painter using gold ink, Sumber Sutera
26. 16.11.96a Female, 30+, Weft Thread Paint Designer, Tampangeng
27. 16.11.96b Female, 20, Weft Thread Painter, Tampangeng
28. 16.11.96c Female, 25, Weft Thread Painter, Tampangeng
29. 16.11.96d Male, 25, Showroom Assistant, Griya Sutera, Sengkang
30. 16.11.96e Female, 35, Weft Thread Painter, Griya Sutera, Sengkang
31. 16.11.96f Female, 15+, Batik Artist, Griya Sutera, Sengkang
32. 19.11.96, 1.12.96, 24.12.96 Female, 60+, Bugis Princess, Proprieter of Apada Hotel, Local Expert on Silks and History
33. 21.11.96a Female, 25+, Silk Worm Farmer, Desa Mallusesalo  
Selecting mature silk worms at time of interview.
34. 21.11.96b Female, 30+, Silk Worm Farmer, Desa Mallusesalo  
Feeding worms with mulberry leaves at time of interview.
35. 24. 11.96 Female, 40+, American, Interests in traditional Sulawesi  
Textiles for teaching puposes.<sup>3</sup>

---

<sup>3</sup> Conducted in English



36. 29.11.96 Female, 35+, Silk Worm Farmer, Desa Sompe  
Her concern was with the reeling of mature cocoons and had three girls under her supervision.
37. 30.11.96a Male, 30+, Market Stall Holder Selling Silk Thread, Dye and Supplementary Weft Threads, Sabbangparu. Ran the stall with his sister and had been doing so for approximately ten years
38. 30.11.96b Female, 40+, Market Stall Holder, Sabbangparu
39. 30.11.96c Female, 30, Market Stall Holder Selling Silk Cloth, Sarung and Other Items, Sengkang
40. 30.11.96d Female, 30+, Baju Bodoh Dyer, Sempange
41. 30.11.96e Female, 20, Baju Bodoh Weaver, Sempange
42. 30.11.96f Female, 25, Silk Cloth Weaver, Sempange
43. 30.11.96g Male, 30, Weft Thread Tension Framer, Sempange
44. 7.12.96 Male, 25, Guide for South Sulawesi, Tanah Toraja
45. 11.12.96 Male, 35, Civil Servant at Perumum Perhutani, Tajuncu, Soppeng
46. 14.12.97 Male, 35, Market Stall Holder, Ujung Pandang
47. 17.12.96 Female, 25+, PhD Student from Australia with interests in Silk and Sengkang.<sup>4</sup>
48. 3.10.97 Female, GTA student from England with interests in textiles.<sup>4</sup>

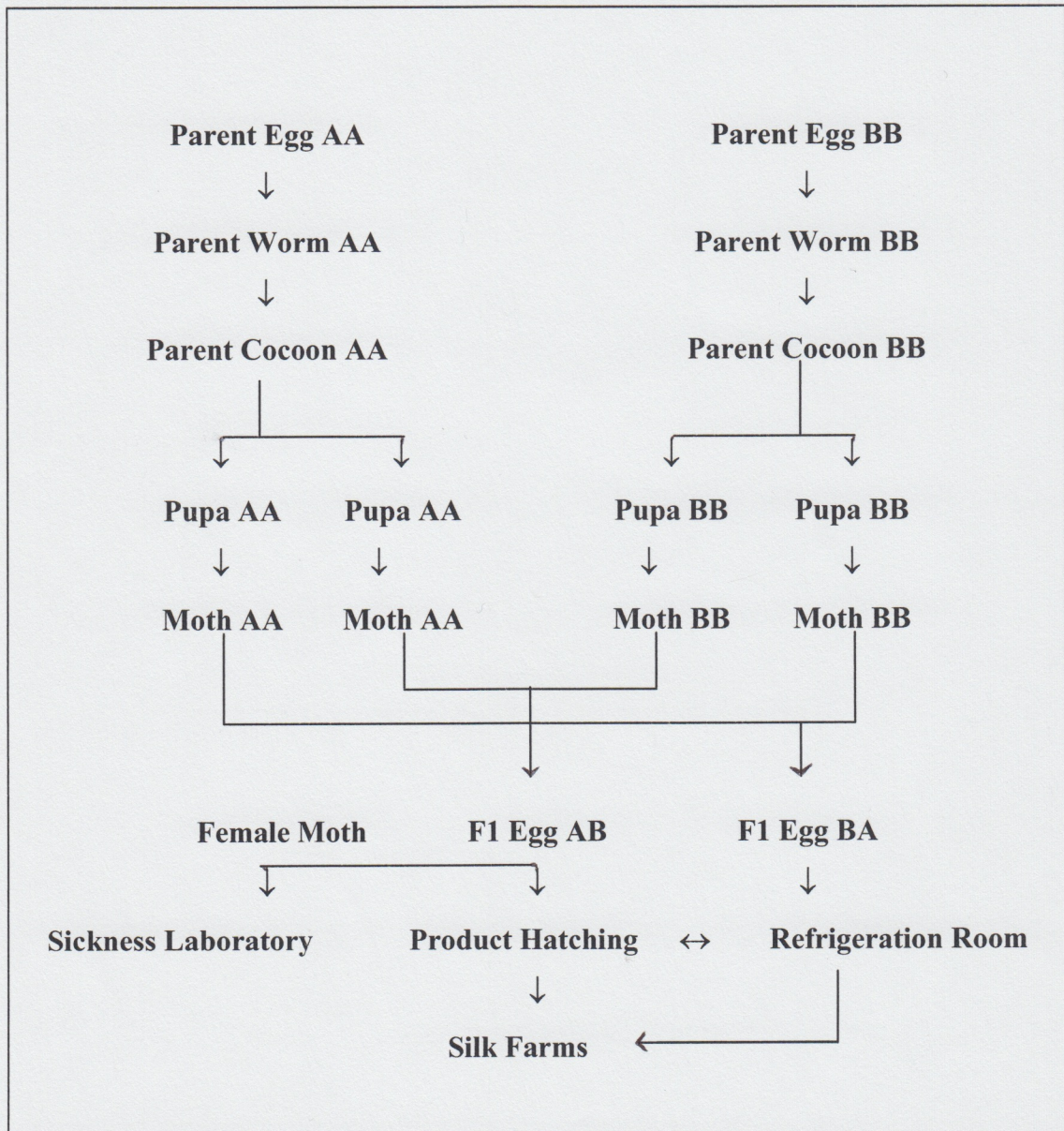
---

<sup>4</sup> Conducted in English.



## APPENDIX B

### THE PRODUCTION OF F1 QUALITY EGGS



Source : This flow chart is built using information from Sekilas Perum Perhutani  
(1996;7)



## APPENDIX C

### HOW TO WORK OUT THE NUMBER OF WARP THREADS FOR CLOTH WEAVING

$$\frac{\text{Width of cloth} + (5\% \text{ width of cloth})}{\text{one inch}} \quad \times \quad \text{Reed Combs} \quad =$$

$$\frac{110\text{cm} + \frac{5 \times 110\text{cm}}{100}}{2.54\text{cm}} \quad \times \quad 80 \quad =$$

$$\frac{110 + 5.5}{2.54} \quad \times \quad 80 \quad = \quad 3600 \pm \text{ threads}$$

Source : Information from Unit Pelayan Teknis Textil, Impa-Impa