

STUDY ON BLACKSMITHS AND AGRICULTURAL PRODUCTIONS IN
SIX SELECTED DISTRICTS

Prepared for

The Intermediate Technology Development Group (Sri Lanka)

by

R. de S. Ariyabandu
R.M. Ranaweera Banda

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1

Study on Blacksmiths and Agricultural Production
in Six Selected Districts

1.1 Background

Blacksmith industry has prevailed in Sri Lanka for many centuries. Most of the metal implements needed for agricultural and domestic use was manufactured by the blacksmiths. It is reported that in the olden days more than 70% of the domestic implements were manufactured by blacksmiths.

In Sri Lanka Blacksmiths have been concentrated within a special caste (Navandanna), concentrated in specific locations. The Blacksmith industry by itself would have been a very important economic venture in olden Sri Lanka. Though the industry had been making an impact in the present economy, specially in the farming sector, the importance given to this industry as an economic venture is negligible.

There are few important Blacksmith villages, Weboda (Gampaha District), Kotmale (Nuwara-eliya District) Parawahera (Matara District) etc. which are supplying a fair share of the local demand of Agricultural and non-agricultural metal implements. However, during the past decade about 30% of the Blacksmiths, mostly individual and some from Blacksmith villages have closed down due to non-availability of infrastructural facilities, lack of state support, poor market, high cost of raw-material, low social status, non-involvement of the second generation in Blacksmithing, and lack of skilled labour. As a result, there are few Blacksmiths at present catering the needs of farmers and other domestic metal tool users. This vacuum created a temporary demand on Blacksmiths, specially during the harvesting season in paddy and tapping season in toddy.

As an experiment to ease the demand on Blacksmiths, the Intermediate Technology Development Group (ITDG) Sri Lanka introduced the power

hammer under it's programme to offer affordable and appropriate technology to rural small-scale economic activities. This was initially introduced to the Parawahera Blacksmith community.

1.2 Introduction

The origin of Blacksmith and Blacksmith industry in Sri Lanka is not exactly known. It is presumed that the origin of Blacksmiths would have coincided with the migration of Indo-Aryans thousands of years B.C. However, according to documented literature Blacksmiths (Achari caste) would have come to Sri Lanka in the 2nd century B.C. with the arrival of the sacred Bo-Tree by Arahath Mahinda. Eminent scholar, Professor Ralph Pieris is of the opinion that Blacksmiths of up-country are the descendants of the Pandyan and other Indian craftsmen who were settled in Sri Lanka by the then Kings in 15th and 16th centuries. According to contemporary Indian history these Blacksmiths would have belonged to Sudra (artisans and untouchables) category in Indian Varna organization. According to Robert Knox's 1681 Ceylon society, the Blacksmiths were ranked together with goldsmiths, carpenters, and painters in the caste hierarchy. In fact Knox identified blacksmiths in the second place to Govi (Cultivation) caste describing it as an inferior cultivator caste. Many scholars who contributed to Ceylon history has placed Blacksmiths in different positions in the caste hierarchy.

Historical chronicals have revealed that traditionally, blacksmiths served the farming community by mending and making agricultural and domestic implements. They were paid for thier services in kind after the harvest. In ancient Sri Lanka these Blacksmiths have lived in all parts of the country serving the peasants and the King under the Rajakariya (work for the King) system.

The Blacksmiths and blacksmithing industry flourished during the Kandyan period. With the downfall of the Kandyan period in 1815, and subsequent take over by the colonizers of Sri Lanka blacksmith

industry was given least priority. The following eras of Portuguese, Dutch and British witnessed the loss of social and economical importance given to blacksmiths and as a result they lost the position which they once enjoyed as members of the blacksmith caste.

Even after independence in 1948 there were no significant support afforded to improve the blacksmithing industry. Even the Industrial Development Policy of the successive governments of 1960 and 1970 had little impact on the blacksmith industry. However, the best period for blacksmiths were between 1974 to 1977 when the Sri Lanka light Engineering Industrial Corporation union functioned well. During this period blacksmiths got the necessary raw-material at very low prices and they could easily make profit by this industry. However, with the introduction of the open economic policies in 1977 the incentives given to the Sri Lanka light engineering industrial corporation was changed. This change demoralized the blacksmith again and the blacksmithing industry was ignored in economic development programmes.

At present blacksmiths are confined to few specific blacksmith villages and few individual blacksmiths mainly in the farming areas. The present individual blacksmiths are a disintegrating entity. This has happened mainly due to lack of demand for individual blacksmiths, high prices of raw-material, lack of skilled labour and second generation moving to other activities which are more socially acceptable and remunerating.

1.3 The Study Objectives

The main objective of the present study is to identify whether assisting blacksmiths with technology would increase the availability of affordable metal agricultural and domestic tools in the rural areas.

In order to answer the above broad question, the study specifically sought the following information from agricultural producers, as the

primary users of blacksmith produce and blacksmiths themselves to seek their opinion on how to improve the technology.

The detail information sought are:

- i. Demand for agricultural metal tools (in general and locally made ones).
- ii. Demand for domestic metal tools in the said agricultural sector (areas).
- iii. Assess the market compatibility of local tools with imported ones.
- iv. Identify the production needs of blacksmiths.
- v. Nature of technology required by blacksmiths.
- vi. Production information of blacksmiths (pricing, cost of production, marketing etc).

1.4 Study Area and Sample

The present study was carried out in six selected districts and a Mahaweli new settlement area to cover a purposive sample of selected beneficiaries.

The selected sample areas are:

- Polonnaruwa district
- Kurunegala district
- Nuwara Eliya district
- Matara district
- Hambantota district
- Matale district
- Mahaweli new settlement (System C)

Within the above seven selected sample area, the study collected two types of information.

- a). Information on demand for agricultural tools from agricultural producers.
- b). Information on production of metal tools from blacksmiths.

1.5 The Sample

As stated earlier the major respondent categories were selected purposively to cover a maximum diversity of metal tool users. However, the selection of actual respondents have been on a random basis.

1.5.1 Agricultural Producers

This category include paddy and plantation sectors. Detailed breakdown of the sample is as follows:

- 1). Paddy farmers 50 Nos. covering Polonnaruwa, Kurunegala, Matara districts and Mahaweli System C.
- 2). Vegetable farmers 25 Nos. covering mainly Nuwara Eliya district.
- 3). Tea small-holders 10 Nos. mainly from Matara district.
- 4). Minor export crops 10 Nos. covering Matale district and Kegalle.
- 5). Cinnamon growers 10 Nos. mainly from Matara district.
- 6). Rubber tappers 10 Nos. covering Matara district and Kegalle.
- 7). Kithul and toddy tappers 10 Nos. covering Kotmale and Wadduwa areas.

Besides this sample, the study included 3-5 chena cultivators from Hambantota area to cover a wide diversity of tool useage.

1.5.2 Metal tool producers - Blacksmiths

This category included five blacksmith villages from Polonnaruwa (Bandanagala), Kotmale, Kurunegala, Apalawala and Parawahera. Besides, 30 individual blacksmiths, five from each district were taken for data collection.

1.6 Methodology

The research team adopted a two prone strategy to collect information

for the study.

- 1). Two separate structured questionnaires were administered to collect information from agricultural producers and blacksmiths and
- 2). Personal interviews and participatory observations of key informants.

The two principal researchers along with other team members and research assistants visited the selected districts to collect information. While bulk of the information necessary for the study was collected through the questionnaire, the more qualitative information was collected through personal interviews on site. The quantitative data were tabulated separately for the two sections and analysed with the help of qualitative information from personal interviews. The data on imports of agricultural tools were collected from leading traders in Colombo while the sales of agricultural tools, manufactured locally and imported, at district level, were obtained by interviewing district and town level traders in the respective districts.

The analysed data are presented in tabular and descriptive forms in chapter two, three and four.

1.7 Limitations of the Study

Due to the restriction in the budget, available resources and time, this study is limited to six districts. Within the districts, the selected sample is presumed to represent the population. However, in large production areas like Polonnaruwa, Kurunegala, Matara, Mahaweli and toddy areas of South there could be variations from sample information. This has to be given due consideration taking resource and time limitation within which the research team had to work during the study period.

2.0 Demand for metal implements in Agriculture

2.1 Paddy Cultivation

Under the present study, major emphasis was given to useage of metal tools in paddy farming. For this reason 50 respondents were from the paddy sector. As stated earlier the 50 paddy farmers were interviewed from three districts and Mahaweli system "C" and "H". In the following analyses the metal tool useage of these farmers are presented districtwise in order to identify the differences that exist within districts though among the same sector.

2.2 Polonnaruwa District

Being one of the most important paddy growing districts in Sri Lanka, almost all farmers are in major Irrigation Settlement Schemes. These farmers cultivate an average extent of 2 1/2-5 acres of land for commercial purposes. As the scale of operation is highly intensive most of these farmers are compelled to use mechanized farming practices i.e. tractors for land preparation activities than buffaloe drawn ploughs as in the past.

The metal tools used in this district for paddy farming are as follows:-

- 1). Mammoty
- 2). Sickle
- 3). Kaththa
- 4). Plough
- 5). Ukunugaha (කුනුගහ)

2.2.1 Mammoty

Both imported (Kimbula) and local (langlo) mammoties are being used by farmers specially for land preparation. However, there appears to be a preference for the imported Kimbula mammoty over the local langlo mammoty.

The main reasons for this preferability is that the Kimbula mamoty is lighter and cuts better. However, those who use langlo mamoties say that it is better than the Kimbula specially on more sandy soils. Some farmers say that the present langlo mamoty is better than the earlier one of the same brand and can be rated better than the Kimbula brand as it can last a longer time. It could be observed from the reactions of respondents that the Kimbula brand is better for wet land cultivation and the langlo is better for highland cultivation and on gravilly sandy soils. Both these brands are purchased from city traders. Both the brands can be used for 1-3 years depending on the intensity of use. If the mamoties are used only for wetland paddy cultivation it can be used for a longer period of time.

2.2.2 Sickles

Though both local (from Blacksmiths) and imported (Chinese) sickles are available in the market only the local sickles are preferred by farmers. The main reason for this preference is that in the local sickle the cutting surface (Kareli - കരളി) is to the right side while in the Chinese sickle the Kareli is to the left. Thus it becomes easier for the user when the formation of Kerali is to the right side. However, this preference can be mainly attributed to the traditional useage of sickles by users. The local sickels are made to order by the blacksmiths because the users do not prefer to purchase ready-made ones from blacksmiths. These local sickles can be used for 5-6 years once made but needs reshaping (Kareli ketima) at least once a season.

2.2.3 Kaththa and Ukunugaha

These are two metal tools used for jungle clearing and spreading harvested paddy. Both the tools are made locally by blacksmiths. Both the tools can be used for a long time (over 10 years) once made, and preference again is for tools made to order. The Kaththa has to be reshapen at least once a year depending on the useage and in the

case of Ukunugaha the point has to be replaced (When made out of metal) once in 5 years.

2.3 Demand on metal tools and perception of farmers on Blacksmiths

From the above discussion it is evident that there is no particular demand on blacksmiths as far as mammoties are concerned. Both brands of mammoties are purchased from traders in the cities. With respect to sickles there appears to be a good demand on local blacksmiths but these too last for a minimum period of 3-5 years. Therefore, the need for new sickles may not arise as it appears to be. However, as the sickles have to be resharpen every season, there is a temporary demand on blacksmiths prior to every harvesting season. In fact this is the only real demand that exist on village blacksmiths as far as paddy cultivation is concerned. However, there is a minor demand on blacksmiths to replace the Heewala in buffaloe drawn ploughs once in two seasons. The knives usually used in jungle clearing in paddy cultivation have a very low demand on the blacksmiths because these tools can be used for at least 10 years before they are replaced by new ones. The only demand here in this case too is when they require resharpening usually once in two years or more.

The biggest obstacle farmers in Polonnaruwa have to face is that they can't get their requirements attended on time by the blacksmiths in the area. The farmers usually have to place their orders 5-7 days before hand to get their tools made or reshaped. Some of the reasons for this delay can be attributed to the following:

- 1). There are very few blacksmiths in the area to meet the demand of all the farmers.
- 2). The blacksmiths do not have sufficient skilled people to attend

to all the demand.

- 3). Most blacksmiths are full time farmers themselves, they lack sufficient time to attend to blacksmith work.
- 4). Most blacksmiths attend to tractor rotaries and disc plough repairs which is more paying than attending to turning out small tools and reshaping them.
- 5). Farmers too wait till the last moment (i.e. in case of sickles they wait till the last two weeks before harvesting) to place their orders.

Therefore it is obvious that the individual village blacksmiths do not have a well distributed demand for metal tools in the farming sector in Polonnaruwa. The only demand they have just prior to the harvesting season is also mostly for resharpening sickles.

An overall picture of the metal tool useage in Polonnaruwa is given in the following table 1.

Details of Metal tool useage by paddy farmers
in Polonnaruwa

Respo dent No.	Monthly income	Tools used	Price (Rs.)	Source of purchase	Prefera- bility	Frequency of purchase	Dist to nearest Black- smith (km)
1	11,000	Kaththa	150-250	Blacksmiths	local	more than	3/4
		mammoty	250	Traders	imported	3 years	
		Sickle	95-100	Blacksmiths	local		
2	2000	Kaththa	150-200	Blacksmiths	local	more than	3/4
		mammoty	250	Traders	imported	3 years	
		sickle	75-100	Blacksmiths	local		
3	No signifi- cant	Kaththa	250(93)	Blacksmiths	local	10 years	4
		mammoty	265(93)	Traders	imported	13 years	
		sickle	150(93)	Blacksmiths	local		
		Ukunugaha	60(90)	Blacksmiths			
4	Not reported	Mammoty	250(92)	Traders	imported	Once a year	3/4
		Sickle	30(89)	Blacksmiths	local	once in 4 years	
5	10,000	Mammoty1	237(93)	Traders	imported	more than 2 years	-
			145(93)				
		Plough	450(93)	Blacksmiths	local	once a year	
		sickle	50-75 (93)			once a season	
6	2500	mammoty	225(90)	Traders	local	3 years	3/4
		plough	250(89)	Blacksmiths		5-6 yrs.	3/4
		Sickle	50(92)			10 years	

7	2500-3000	mammoty (3)	165(91)	Traders	local	3 years	3/4
		sickle(1)	240(91)	imported	imported	5-6 years	3/4
			35(90)				
		Ukunugaha	45(89)	Blacksmiths	local	10 years	
8	8000-10000	mammoty	245(93)	Traders	local	1 year	3 1/2
		sickle	60(93)	Blacksmiths		more than	
						2 years	
9	4000	mammoty	250(90)	Traders	local	2 years	3/4
		sickle	30(80)	Blacksmiths		more than	
						5 years	
10	2000	mammoty	235(92)	Traders	imported	2 years	3/4
		(1)					
		(2)	-		local		
		sickle	35(85)	Blacksmiths	local	5 years	

Figures in parantheses are year of purchase.

1 - Kimbula brand

2 - Kukula brand

3 - Langlo brand

2.4 Paddy Cultivation in Mahaweli Settlement Schemes

The farmers of Mahaweli settlement schemes are those dislocated from elsewhere, mainly from the wet zone and relocated in the Mahaweli basin. These farmers are given two and half acres of low land and half an acre of highland as a homestead. Farmers of Mahaweli schemes cultivate paddy for both Yala and Maha seasons.

Metal implements used in paddy cultivation by these farmers does not differ very much from that of Polonnaruwa. The main metal implements used are:

- 1) Mammoty
- 2) Sickle
- 3) Kaththa
- 4) Plough

One of the significant differences in implement usage in Mahaweli is the preference for the local langlo mammoty by the majority over the imported Kimbula mammoty. The main reason attributed to this preference is the light sandy type of soil (Reddish Brown Earth) that is prevalent in most parts of Mahaweli schemes. Though the langlo mammoty is heavier it lasts a long time when cultivating in sandy soils. The few who used Kimbula acknowledged the cutting quality of it but said that it cannot withstand the rough sandy soils for a long time. Infact their response to the preferability question was "Kimbula mammoty splits when used for a long time in Mahaweli soils". These mammoties either local or imported are freely available in most towns in Mahaweli settlements. The farmers who used Kimbula mammoties have to buy new ones at least once a year and in some instances once a season while the langlo can be used for a minimum period of 2 years or more.

There is no significant difference from other farming areas in the usage of sickles. All farmers buy their sickles from blacksmiths, usually specifically ordered from blacksmiths or bought from traders which are made by blacksmith communities. Sickles once made can be used for at least 2-5 years except that it has to be resharpened once in two seasons. Thus, the demand for village blacksmiths would only appear during such periods, specially, immediately before harvesting time.

Mahaweli being a highly mechanized farming venture, most farmers use tractors for land preparation. However, still one finds few farmers who use bullock drawn ploughs for land preparation. In such event the Heewela in the ploughs have to be replaced at least once a season due to high wastage in Reddish Brown Earth soils. This replacement is also done by the village blacksmiths. Thus, the demand for them could increase depending on the extent of plough usage but in reality this is not significant in Mahaweli areas.

The following table presents the details of metal tool usage by Mahaweli farmers.

Table : Details of Metal Tool Usage by Mahaweli Farmers

Resp. No.	Monthly income	Tools used	Price (Rs.)	Source of purchase	Preferability	Frequency of purchase	Dist. to the nearest blacksmith (km.)
1	3500	mammoth sickle plough	250 (92) 100 (92) 700 (92)	Traders blacksmiths blacksmiths	local	>3 yrs. 2 yrs. >3 yrs.	1/4
2	4200	mammoth	250 (92)	Traders	local	1 yr.	1 1/2
3	2800	mammoth sickle	240 (92) 75 (92)	Traders blacksmiths	imported local	1 yr. 2 yrs.	1/4
4	5500	mammoth sickle	175 (92) 35 (89)	Traders blacksmiths	imported local	once a season 7-8 yrs.	1/4
5	2250	mammoth sickle	160 (90) -	Traders blacksmiths	imported local	2 yrs.	1/4
6	2600	mammoth sickle	180 (89) 40 (90)	-	-	-	-

7	4800	mammo- 150 ty (89) sickle 40 (88) Rake 55 (90)	Traders black- smiths Traders	imported 2 yrs. 5 local 2 yrs. local - -
8	2300	mammo- 260 ty (91) sickle 150 manna 60 (90)	Traders black- smiths black- smiths	imported 1 yr. 1 1/4 local >3 yrs. - local >3 yrs. -
9	2800	mammo- 160 ty (90) sickle 30 (89)	Traders black- smiths	local once a season 1 1/4 >3 yrs.
10	2700	mammo- 180 ty (89) sickle 30 (89)	Traders black- smiths	local 1 yr. 1/4 2 yrs.
11	3000	mammo- 170 ty (89) sickle 25 (89)	Traders black-	local 3 yrs. 1/4 local 2 yrs. -
12	3000	mammo- 225 ty (92) sickle 75 (92) plough 250 (55)	Traders black- smiths Traders	imported 2 yrs. - local 5 yrs. - local - -

2.5 Paddy cultivation in Kurunegala District

The farmer sample selected in Kurunegala was mainly minor tank (less than 200 Ac command) cultivators in and around Panduwasnuwara. Most of the farmers cultivate small parcels of highland besides their paddy plots. This is mainly done to augment the family income which is hardly substantial from cultivating a small plot of paddy under minor irrigation.

Due to the above diversity most of these farmers have the experience of using both Kimbula and Langlo mammoties. In farmers opinion, the imported Kimbula mammoty is better for lowland cultivation because it cuts better, easy to use but wears off fast. The langlo mammoty is better for highland cultivation because it is hardier, can use for a long time and resist cracking in gravelly sandy soils. Farmers from Panduwasnuwara area (respondent No.1-7 in Table) prefer the langlo mammoty because a). they have got used to it in the absence of Kimbula (during the period the imports were stopped) and b). They use it for both lowland and highland cultivation. However, due to the latter reason these farmers have to purchase new mammoties at least once a year if not once a season.

Respondent No.8-12 were interviewed from Polgahawela area in the Kurunegala district. This incidentally is the more wetter part of Kurunegala district (intermediate zone). In this case too the farmer preference had been to the Langlo mammoty. But the difference is as it is being used for more lowland cultivation, it can last for at least 4-5 years unlike in the case of Panduwasnuwara (less wetter part) farmers.

In the useage of sickles one does not observe a significant difference from other paddy growing areas. Here too the farmers prefer the local sickles specially made to order by the blacksmiths. These sickles can be used for about 5-10 years depending on the type of useage. If the sickles are used only for harvesting paddy it can be used for a long time but if it is used for both cutting grass (in case of feeding cattle) and harvesting it will

at a shorter time. Irrespective of the purpose it is being used the sickles need to be resharpended (Karali-ketima) once a season. This usually farmers do towards the harvesting period thus creating a temporary demand in village blacksmiths. For this service, blacksmiths in Kurunegala generally charge Rs.25/- per sickle. The preference for the local sickle is because the Kerali in this is on to the right side which is used to local farmers. Due to this positioning the tendency to injure oneself while harvesting is much less than the Chinese sickle.

A notable difference in implement useage in Kurunegala under minor irrigation is the use of buffaloe drawn ploughs instead of tractors. In fact all the sample farmers from Kurunegala use ploughs for land preparation. These ploughs can be used for 2-5 years but the Heewela has to be changed depending on the type of operation. If the plough is used for land preparation under dry sowing (usually done under minor tank cultivation) the plough waste is high, thus the Heewela has to be changed every season. If it is for wet land preparation plough waste is not so high then the Heewela has to be changed only once in two seasons. In case of Atawera Liyaddy (good fertile soil) the plough waste is even less, thus the need to change the Heewela is only once in two years (4 seasons). For changing a Heewela the blacksmiths in Kurunegala charge Rs.40/-. Therefore the demand on local blacksmiths can be relatively high compared to other districts mainly under major irrigation schemes, where mechanized farming is more prevalent than traditional farming using buffaloe drawn ploughs. Another significant difference in this area under minor tank irrigation is the distance the farmers have to travel to the nearest Blacksmith. As village individual blacksmiths are an extincting entity, one wouldn't expect to find them for all small tanks. Thus their distribution may be to serve the farming community of couple of small tanks together.

The farmers we interviewed in Kurunegala complained that the village individual blacksmiths cannot cope-up with demand particularly because of the dearth of blacksmiths in the area. In certain instances farmers themselves had to supply the metal for their tools as raw-material has become an acute problem for many blacksmiths. These problems coupled with

the second generation migration to other occupation have created a vacuum in the blacksmithing industry.

Details of metal tool useage by paddy farmers
in Kurunegala

Respon- dant No.	Monthly income	Tools used	Price (Rs.)	Source of purchase	Prefera- bility	Frequency of purchase	Dist to nearest Black- smith (km)
1	No significant income.Land given on	mammoty sickle plough	265(92) 50(86) 150(92)	Traders Blacksmiths	) )local	once in 3 seasons 7 years 5 years	6 1/2
2	4000	mammoty	265(92)	Traders	local	once a season	8
3	3500	mammoty plough sickle	245(92) 75 (91/92) -	Traders Blacksmiths	imported local	- once in 5 seasons	1 1/2
4	2000	mammoty (1) (2) Plough sickle	220 100 125	)Traders Blacksmiths	local imported)local	)1 year 1 year 5 years	2 1/2
5	1000	mammoty plough sickle Harrow	265(93) 150(93) 40(93) 150(93)	Traders Blacksmiths	)local local	2 years more than 2 years	4 1/2

6	5000	mammoty	275(93)	Traders	imported	1 year	
		(2)					
		plough	265(93)	)Blacksmiths	local	1/2 - 1	3
		sickle	60(93)	)Blacksmiths	)local	10-15	
						years	
		Harrow	150(93)			5-6 yrs.	
7	4500	mammoty	265(93)	)Blacksmiths	local	once a	3
						season	
		plough	200-225			1 year	
			(75)				
		Sickle	75(93)			1 year	
8	2200	mammoty	140(85)	)1	local	5 years	2
		plough	120(88)	)Traders		more than	
						5 years	
		Sickle	35(84)			-	
9	3200	mammoty	200(90)	Traders	local	4-5 years	4
		plough	140(90)	)Blacksmith		4-5 years	
		sickle	35(85)			10 years	
10	3500	mammoty	180(88)	Traders	)local	4 years	1 1/2
		Plough	100(86)	Blacksmiths		4 years	
		sickle	30(84)	Traders		7-8 years	
11	300	mammoty	190(90)	Traders	local	10 years	2
		(2)					
		(1)	290(92)		imported	4-5 years	
		Sickle	50(92)		local	7-8 years	

Figures in parantheses are price of purchase

- Kimbula Brand
- Langlo Brand

6. Paddy Cultivation in Matara District

Most of the sample farmers interviewed in Matara for metal tool useage were rainfed farmers. These farmers cultivate approximately 1/2 - 3 acres in

Maha and $1/8 - 1/2$ acre in Yala seasons. In Maha it is predominantly paddy cultivation while in Yala they cultivate mix crops including vegetables and pulses.

The two main metal implements used by these farmers are mamoty and sickle. The notable difference in this case is that none of the farms interviewed used buffalo/cattle drawn ploughs for land preparation. This is unusual being subsistence rainfed farmers. The main reason however for using two-wheel tractors for this purpose is the lack of cattle and buffaloes in the district for ploughing.

These farmers use both langlo and imported Kimbula mammoties. However, the preference appears to be for the imported mamoty as it is easy to use and cuts well specially under lowland paddy cultivation. The duration of useage for both mammoties depend on the extent cultivated. Thus the local mammoties are used for 3-5 years while the imported mammoties have been used for 2-10 years and in some cases upto 12 years.

As far as the sickles are concerned all farmers prefer to have the sickles turned out by blacksmiths than the imported Chinese one. The preference for the local sickle is mainly because of its curvature and the way kelaris are placed. The imported sickle is cheaper than the local one but the preference is for the local sickle due to the above reason and its durability.

As can be observed in the table these local sickles can be used for 10 years or more, thus the demand on blacksmiths for new sickles are rather remote. However, the blacksmiths assistance is sought during the harvesting season and immediately prior to that for resharpning (keraliketima) the sickles. The location of the nearest blacksmith to sample farmers vary between $1/2 - 13$ km. Therefore, it is evident that those farmers who have to travel more than 5km. have to place their orders (in this case to resharpen) well ahead of time as the farmers cannot be visiting blacksmiths too often.

Table : Details of Metal Tools usage by
Matara Paddy Farmers

Resp. No.	Monthly income	Tools used	Price (Rs.)	Source of purchase	Preferability	Frequency of purchase	Dist. to the nearest black-smith (km.)
1	2400	mammoth sickle	-	Traders	local	can be used for long time	1 1/4
			-	black-smiths			
2	2600	mammoth sickle	170 (84)	Traders	imported	10 yrs	5
			30 (86)	black-smiths	local	10 yrs.	1.5
3	2800	mammoth	150 (88)	Traders	local	can be used for long time	-
4	3000	mammoth(I)	130 (88)	Trader	local	5 yrs.	6.5
		mammoth(L)	240 (90)	Traders	-	-	6.5
		sickle	40 (82)	black smiths	-	-	1.5
5	2500	mammoth sickle	150 (89)	Traders	imported	12 yrs.	1.25
			30 (84)	black-smiths	local	10 yrs.	
6	3000	mammoth sickle	300 (92)	Traders	imported	3 yrs.	0.5
			80 (89)	black-smith	local	15 yrs.	0.5

7	3500	mammo- ty	325 (89)	Traders	imported	2 yrs.	6.5
8	3600	mammo- ty	190 (90)	Traders	imported	10 yrs.	5
9	2600	mammo- ty	NR (97)	Traders	imported	2 yrs.	1
10	3100	mammo- ty sickle	NR (92) 60 (NR)	Tradersq black- smiths	local local	4 yrs. 15 yrs.	13 1
11	1800	mammo-	NR	Traders	imported	10 yrs.	1
12	2500	mammo- ty sickle	180 (90) 35 (89)	Traders Traders	local local	3 yrs. 4 yrs.	1 1

Figures in paranthesis are years of purchase

The following table illustrates the details of metal implement useage by Matara rainfed paddy farmers.

Minor Export Crop Cultivation and Metal Implement Usage

The survey interviewed 10 farmers growing mix crops of pepper, cloves, coffee, cardamoms etc. These farmers were interviewed both in Matale district and Kegalle. Though most of these crops had a good demand in the past, during the past few years the demand had gone down resulting in very low prices for growers. For example cloves which fetched almost Rs.400 per 1 kg. four years back, fetchs only Rs.50 per kg. at present. Same is with pepper an many other spice crops.

There are no special metal implements used in MEC cultivation. Usually growers use pruning knives, forlks, long knives, keki knives besides the mamoty they use for cleaning and weeding. None of the above mentioned implements have any specificity to MEC. They are the same metal implements used in many other crop cultivations. Prunning knives are used to prune coffee trees and pepper wines (sometimes) and prune the branches of pepper wine support trees. Long knives and keki knives are also used for pruning coffee branches etc. The forlks are used for losening the soil before fertilizing. However, this does not happen now as many of the MEC plantations are not fertilized due to low demand. As most plantations ar on highland, the growers prefer to use the local langlo mamoty to the imported kimbula or any other brand. Incidentally the performance of the local mamoty on highland have been always superior to the imported mamoty. Except for the mamoties and the forlks all other implements used are made by blacksmiths. However, there is no great demand on blacksmiths at present as most of the MEC plantations are in a state of neglect due to low prices.

Even when the MEC prices were good the demand on local blacksmiths for these metal implements would have been low as the life time of most of these tools are more than four years. Therefore, like in many other cases, the only meagre demand on blacksmiths in MEC areas surface when the growers want to resharpen their tools. Unfortunately this too does not appear to

Table : Details of Metal Tool Usage of MEC Growers in
Matale District and Kegalle

Resp. No.	Monthly income	Tools used	Price (Rs.)	Source of purchase	Preferability	Frequency of purchase	Dist. to the nearest black-smith (km.)
1	3400	mammoth Pruning knife sickle	160 (91) 60 (86) 20 (NR)	Traders black-smiths	local	once in 8 yrs.	3.0
2	2200	mammoth Pruning knife	- 140 (90) -	Traders black-smith Traders	local imported	3-4 for long time for long time	1 1/2
3	2700	mammoth Pruning	250 (92) 80 (88)	Traders black-smiths	imported local	2 yrs. for long time	1/4
4	1325	mammoth Pruning knife forlk sickle	110 (89) - - -	Traders black-smith Traders black-smiths	local imported local	for long time for long time	

5	2200	mammoth	220 (92)	Traders	local	4 yrs	3
6	2200	mammoth Pruning knife	220 (90) 60 (89)	Traders black-smiths	local	7 yrs for long time	3
7	2700	mammoth	225 (92)	Traders	local	2 yrs.	1 1/2
8	4200	mammoth keki knife long knife	175 (90) 75 (89) 75 (90)	Traders black-smiths	local	for long time	8
9	2200	keki knife	70 (89)	black-smiths	local	7-8 yrs.	-
10	1900	mammoth long knife keki knife	230 (91) 60 (85) 35 (86)	Traders black-smiths	imported local	7-8 yrs.	1/4

Figures in paranthesis are years of purchase

happen that often as most MEC do not require regular pruning.

The usage of metal tools and their details are given in the following table.

2.8 Cinnamon Cultivation

Cinnamon is a popular condiment, grown along the coastal belt in the South, mainly from Batapola to Galle district. The cinnamon industry is restricted to a few specialized persons involved in the cultivation in the above said area. Most of the small-scale cinnamon growers own anything between 1/8 - 3/4 of an acre of highland cultivated to cinnamon. At present, open market prices of cinnamon varies between Rs.125/- - Rs.150/-. With this price the small cinnamon cultivation earns a monthly income, between Rs.1,300/- - Rs.2,400/- depending upon the size of holding he owns. Besides small-scale cultivators, there are two other categories in the cinnamon industry. They are big time traders in the industry and hired labour who possess the skill and tools to peel cinnamon.

The art of peeling and processing of cinnamon requires traditional metal tools and skilled persons. The tool used in this industry are:

- i. Kaththa (කැත්ත)
- ii. Pinthala Polle (පින්තල පොල්ල)
- iii. Ko kaththa (කොකැත්ත)
- iv. Cinnamon knife (කැපුණු පිහිට)
- v. Scissor (කැර)

The functions of these tools in the industry are given below:

- 1). Kaththa - To cut cinnamon trees.
- 2). Piththala polle - To beat the cinnamon bark after cutting

(9" in length)

- 3). Ko kaththa - To scrape the bark
- 4). Cinnamon knife - To peel the bark
- 5). Scissor - To cut ends of 3 1/2' cinnamon bundles.

Besides these metal tools the cinnamon peelers use small rubber protectors on fingers to protect fingers being hurt. Another tool used in the industry is the Pathi Kotte (පැති කෝට්ට), which is used to measure 3 1/2' cinnamon sticks and put them to a side.

Out of the five metal tools used in the industry, except for the scissor all the others are locally manufactured tools bought usually from blacksmiths. The scissor, which the cinnamon growers in Matara district use, is an imported item usually bought second hand from barber shops in the area. The cinnamon knife and the scissor are both made out of stainless steel metal. Thus it becomes imperative that the metal for the cinnamon knives have to be provided to blacksmiths. This the growers oblige by providing old stainless steel spoons to manufacture cinnamon knives. These knives are usually about 3" in length. The reason for using stainless steel is to avoid and stains on the cut-edge of the cinnamon stick. This could usually happen if metal tools are used instead of stainless steel. The use of second hand scissors from barber shops is also due to the same reason.

Though most of these tools are brought from blacksmiths, the frequency of purchase is much phased out as these tools made of steel alloy last for a long time. According to the responses we received during the survey, these tools can last for a period of 8-10 years depending on the degree of usage. Infact in one instance the tools (cinnamon knife and Ko kaththa) had been bought as far back as 1975. Therefore it appears that the demand for new tools on village blacksmiths can be very low. However, the survey identified blacksmiths within the range of 1/2 - 5 km. from cinnamon growers. As far as cinnamon growers are concerned, they visit the blacksmiths whenever they have to sharpen their tools during peeling seasons and occasionally to get new tools made. Further the general

preference of cinnamon growers are for the tools that are manufactured at Farawahera.

A complete picture of the tools used preferability, price structure and frequency of purchase are given in Table

Details of metal tools used by Cinnamon growers
in Matara

Respon- dent No.	Monthly income	Tools used	Price (Rs.)	Source of purchase	Prefera- bility	Frequency of purchase	Dist. to nearest Black- smith (km.)
1	2000	1	70 (92)	Blacksmiths	foreign	10-15 years	1/2
1	2000	1	70 (92)	)	)	10-15 years	1/2
		2	60 (92)	)Blacksmiths	)local		
		3	25 (92))))	
		4	20 (92))))	
		5	20 (86)	Barbers	Foreign)	
2	1800	1	50 (82))))	
		2	40 (82)	)Blacksmiths	)local	)10-15 years	1/2
		3	15 (82))))	
		4	15 (88))))	
		5	30 (88)	)Barbers	)foreign)	
3	1550	1	25 -	)	)	8-10 years	3/4
		2	80 (89)	)Blacksmiths	)local)	
		3	10 (85))))	
		4	- -				
		5	70 -	Barbers	Foreign		
4	1325	1	75 (90)	)	)	)	1/2
		2	70 (85)	)Blacksmiths	)local	)6-10 years	

		3	25 (92))))		
		4	20 (90))))		
		5	25 (88)	Barbers	Foreign	imported		
5	2100	1	60 (88))))		
		2	75 (85)	)Blacksmiths	)local	)10-15 years	3/4
		3	10 (85))))		
		4	10 (85))))		
		5	20 (88)	Barbers	Foreign	8 years		
6	1800	1	50 (88)	)	)	)	1/2
		2	50 (88)	)Blacksmiths	)local	)10 years	
		3	10 (82))))		
		4	15 (88))))		
		5	40 (90)	Barbers	Foreign)		
7	2300	1	40 (82)	)	)	)	4
		2	40 (80)	)Blacksmiths	)local	)6-10 years	
		3	10 (80))))		
		4	10 (85))))		
		5	20 (86)	Barbers	Foreign)		
8	1400	1	40 (88)	)	)	)Not	5
		2	60 (88)	)Blacksmiths	)local	)bought	
		3	10 (88)	)	)	)since last	
		4	10 (88)	)	)	)bought in '88	
		5	20 (88)	Barbers	Foreign)		
9	2400	Does not possess his own tools but hires skilled labour with tools						
10	2300	1	40 (79)	)	)	)	3 1/2
		2	35 (75)	)Blacksmiths	)local	)10 years	
		3	10 (78))))		
		4	8 (75))))		
		5	45 -	Barbers	Foreign	)10 years	

Figures in parantheses are the year of purchase

- 1 - Kaththa (කැත්ත) 3 - Ko keththa (කොකැත්ත)
 2 - Pithela Polla (පිත්ල පොල්ල) 4 - Cinnamon poling kinife
 5 - Scissors

(3) Item:

Crowbar		Costs Rs.	% from total Costs
Raw material	Quantity		
Mild Steel	6 Kg	48.00	32.7
Charcoal	5 Kg	60.00	40.8
Total material costs		108.00	73.5
Labour		38.00	25.9
Depreciation		.80	0.5
Overheads		.20	0.1
Total Production Costs		147.00	100.0
Sale Price per Crowbar		175.00	-
Profit margin		28.00	-

Epalawa

(1) Item:

Mahapihiya (large knife)		Costs Rs.	% from total Costs
Raw material	Quantity		
Hard steel	1 1/2 Kg	23.00	22.6
Charcoal (wood)	3.3 Kg	24.00	23.6
Coconut Oil	-	6.50	6.4
Wooden handle		3.00	2.9
Nails		1.75	1.7
Total material costs		58.25	57.2
Labour		35.75	35.1
Depreciation		7.60	7.6
Overheads		.17	0.1
Total Production Costs		101.77	100.0
Sale Price per Knife		125.00	-
Profit Margin		23.23	

(2) Item:

Sickle		Costs Rs.	% from total Costs
Raw material	Quantity		
Hard Steel	500gs	7.50	21.2
Charcoal (Wood)	1 Kg	7.00	19.8
Wooden Handle	-	2.00	5.6
Total material costs		16.50	46.6
Labour		15.00	42.4
Depreciation		3.75	10.6
Overheads		.12	0.4
Total Production Costs		35.37	100.0
Sale Price Per Sickle		50.00	-
Profit Margin		14.63	

Parawahera

(1) Item:

Manna Knife		Costs Rs.	% from total Costs
Raw Material	Quantity		
Hard Steel	1 Kg	14.00	20.9
Charcoal (wood)	2 Kg	16.00	23.9
Wooden handle	-	4.00	6.0
Wheel	-	2.00	3.0
Total material costs		36.00	53.8
Labour		24.00	35.8
Depreciation		6.75	10.1
Overheads		.20	0.3
Total Production Costs		66.95	100.0
Sale Price per Knife		85.00	-
Profit Margin		18.05	-

(2) Item:

Sickle		Costs Rs.	% from total Costs
Raw material	Quantity		
Hard Steel	500gs	7.50	21.2
Charcoal (Wood)	1 Kg	7.00	19.8
Wooden Handle	-	2.00	5.6
Total material costs		16.50	46.6
Labour		15.00	42.4
Depreciation		3.75	10.6
Overheads		.12	0.4
Total Production Costs		35.37	100.0
Sale Price Per Sickle		50.00	-
Profit Margin		14.63	

Parawahera

(1) Item:

Manna Knife		Costs Rs.	% from total Costs
Raw Material	Quantity		
Hard Steel	1 Kg	14.00	20.9
Charcoal (wood)	2 Kg	16.00	23.9
Wooden handle	-	4.00	6.0
Wheel	-	2.00	3.0
Total material costs		36.00	53.8
Labour		24.00	35.8
Depreciation		6.75	10.1
Overheads		.20	0.3
Total Production Costs		66.95	100.0
Sale Price per Knife		85.00	-
Profit Margin		18.05	-

(2) Item:

Scrape		Costs Rs.	% from total Costs
Raw material	Quantity		
Mild Steel	300g	5.00	29.5
Charcoal	500g	6.00	35.4
Total material costs		11.00	64.9
Labour		5.00	29.5
Depreciation		.85	5.0
Overheads		.10	0.6
Total Production Costs		16.95	100.0
Sale Price Per Scrape		22.00	-
Profit Margin		5.05	-

Although the above calculations show certain variations with regard to the costs and profit margins of tools produced in the blacksmithing community, the general situation is more or less the same in the country as a whole when taken into consideration the unit costs of a tool. For example, the costs of labour of all types of tools consists of about 30 - 40 per cent from the total cost. It could be observed that the cost of labour in the case of hard tools like Axes, Mannas, Maha pihiya (large knife) etc., is somewhat higher than that of the simple tools like Scrapes and Spoons. As far as the material costs are concerned, they account for about 50 - 60 per cent of all kinds of tools which were taken into consideration in this analysis.

Accordingly, from a technology dissemination point of view, what is important is a technology which helps the blacksmiths to reduce the costs of labour. The following table is presented to show the percentage of material and labour costs of some selected tools.

Table: 2

Percentage of material and labour costs of tools.

Tool	Total costs (Rs.)	Material costs (%)	Labour costs (%)
Mannaya	66.95	53.8	35.8
Scrape	16.95	64.9	29.5
Sickle	35.37	46.6	42.4
Large knife	101.88	57.2	35.1
Axe	84.30	64.5	32.0
Pruning Knife	62.63	50.1	39.9

(No. 3)

The costs of material and labour have increased rapidly during the past two decades, and consequently, some of the blacksmiths have abandoned the production. Such cases were found in the Mawatura (Kothmale) and Bandanagala blacksmithing communities. Similarly, some of the blacksmiths have started producing only simple tools, for which the material and labour costs are comparatively low.

When considering the pattern of employment in the blacksmithing industry, and given the labour intensive nature of the industry, it can be seen very clearly that it creates employment mostly for men. It could also be seen that the industry does not create a large number of employment opportunities like, for instance, in agriculture. In a majority of forges (14), the number of persons employed was only two, including the owner of the forge. Out of the 28 forges visited, six had a work force of just one person (the owner of the forge). An assistant was hired by these persons only when there was excess work. A different pattern was observed in six other forges, where two extra persons had been employed regularly. In these places, production was done on a commercial scale in which tools were produced either on orders, or for selling them in polas by the blacksmith himself.

3.6 Marketing:

The market for blacksmiths' products is seasonal, but it is difficult to identify a uniform pattern which can be generalized for the whole country. The following chart shows the periods during which an increase in demand is observed in different blacksmithing communities.

Name of the Community	Season(s)
Mawatura (Kothmale)	March - August
Parawahera (Matara)	March - May and August - October
Bandanagala (Polonnaruwa)	February - March - and July - August
Epalawa (Kegalla)	January - July
Puwakdandawa (Hambantota)	February - April and July - October

During these periods, blacksmiths in these communities receive orders for tools from the traders who usually come to the village to purchase them. During the rest of the year, (which is not indicated in this chart) the demand for tools decreases. However, in places like Mawatura, Epalawa, Parawahera, production is continued even though scale of such production is somewhat less than that during the peak season.

A large part of the tools produced in these blacksmithing villages is marketed in polas (weekly fairs) by traders with whom the blacksmiths maintain regular contact. A small number of blacksmiths are also market tools themselves. Out of the 28 blacksmiths interviewed, 6 belong to this latter category and 15 belong to the former category. The tools produced by the balance 7 blacksmiths were marketed within the village (to the regular customers) by the blacksmiths themselves.

In addition to these, it was also found that a few traders in the main towns (Kandy 1, Kurunegala 1, Kegalle 3, Kaduruwela 2, Matara 2) are engaged in the marketing of tools. The tools which are sold by these traders are obtained from blacksmiths on orders. The individual blacksmiths who live close to these towns also sell a part of their products to these traders.

It was observed that the open market price of tools is considerably higher than the price received by the blacksmiths at the blacksmithing workshop. The main reason for this is the lack of direct contact between the end user and the producer. It was seen that the majority of blacksmiths are not aware about the market prices of their tools or the magnitude of the demand for different kind of tools. As a result, in determining the price of a particular tool, the traders' position is much more powerful than that of the blacksmith.

One consolation is that, as far as the individual blacksmiths are concerned, the prices at which they sell their products are comparatively high due to the fact that there are no middleman in this trade, as in many other trades.

The following list shows the price received by blacksmiths and the market price for some of the tools.

Tool	Blacksmiths' Price (Rs.)	Market Price (Rs.)
Table Knife	23	30
Manna	55	85-100
Large Knife	125	165-175
Knife (3/4 or No.7)	75	100-110
Knife (1/2 or No.5)	65	80
Knife (1/4 or No.3)	50	70-75
Axe (1/2)	50	90
Axe (3/4)	70	115
Axe (large)	100	150
Scrape (No.1)	10	15-18
(Scrape (No.2)	20	30
(Scrape (No.3)	30	40
Dodol Spoon	45	75
Giraya (No.1) (Nut Cutter)	30	45
Giraya (No.2)	35	50

Tool	Blacksmiths' Price (Rs.)	Market Price (Rs.)
Giraya (No.3)	40	60-75
Ketta	85	125
Poke	850-900	?
Panketta	4	10
Kurahanketta	8	18-20
Sickle (No.1)	35	45
Sickle (No.2)	50	65-70
Crowbar	175	225
Heewala	35	?

These figures give only a rough idea about the prices of tools. The prices vary from place to place, and sometimes from trader to trader in a same street, a Pola or a town.

It was seen that some of the blacksmiths have established strong links with traders. In Parawahera, for example, two blacksmiths have maintained a supplier - purchaser relationship with 2 traders over the last 26 years. A number of such cases were found in other blacksmithing communities as well. This indicates a market in which the transactions are taking place on personal relationships based on mutual trust and friendship. This system is in favour of traders, but the blacksmiths also get a set of benefits which help them to meet at least the minimum subsistence needs of their families. Those benefits are:

- (a) Credit: the blacksmiths obtain credit from the trader(s) with whom they are in contact, to meet their immediate cash needs, e.g. to purchase raw material, consumer items or for a ceremony, illness, etc.
- (v) A ready market: the blacksmiths who are in contact with traders do not face a problem of marketing their products as the traders visit the forge regularly.

The distribution and marketing of tools at present are done mainly by traders. Following are the districts and respective areas where the traders engage in the distribution and marketing of agriculture and domestic tools.

District	Area	Village from which tools are purchased
Matara	Deniyaya, Matara, Weligama Yatiana, Kamburupitiya, Hakmana	Parawahera
Hambantota	Hambantota, Ambalantota, Embilipitiya, Tangalle, Beliatta.	Puwakdandawa and Parawahera
Polonnarawa	Polonnaruwa, Diyabeduma, Bakamuna, Kaduruwela	Bandanagala Epalawa Weboda
Matale	Dambulla, Naula Galewela	Epalawa Wattegama
N. Eliya	Talawakele, Agarapathana, Nuwara Eliya, Pussallawa, Nawalapitiya	Mawatura (Kothmale)
Galle	Galle, Imaduwa	Bandangala Weboda
Kalutara	Agalawatta, Matugama	Mawatura (Kothmale)
Kandy	Kandy, Gampala	Epalawa Wattegama
Kurunegala	-	Weboda
Moneragala	Wellawaya	Parawahera
Ampara	-	Epalawa

It can be seen that the six blacksmithing communities which are indicated in the above chart are the main suppliers of agriculture and domestic tools for 11 districts. Though there was no supportive proof due to the smallness of the sample, these communities could possibly be the suppliers of tools for other districts as well.

3.7 Problems Faced by the Blacksmiths:

As mentioned earlier, blacksmithing is a highly neglected industry in Sri Lanka. The policies which had been introduced in 1972 to develop this industry were effective only for a short period, i.e. until 1978, and thereafter, neither the government nor the private sector organizations seem to have taken any interest about the development of this sector. As a result of this negligence, the people who are engaged in this industry face a number of problems which are discussed under the following areas.

- (a) Marketing of tools
- (b) Availability of labour
- (c) Technology

3.7.1 (a) Marketing of Tools:

More than 70 per cent of the demand for tools used in agriculture and domestic level is met by the local blacksmiths. However, the income that the blacksmiths earn from the industry is considerably low, partly due to the existing marketing system. As mentioned in the section on marketing, the tools produced by the blacksmiths are marketed mainly through middleman traders. Even though this system is well established at present, a larger share of the profits of the blacksmithing industry goes to the middleman traders. Consequently, the majority of blacksmiths have not been able to improve their standard of living (e.g. housing, education, health, income, etc.) or the conditions of their workshops.

The existing marketing system does not allow the blacksmiths to assess the size of market for different types of tools that they produce, or the real needs of the users of such tools. In other words, there is a large gap between the producers and users of tools, and the producer has no way to understand the needs of the user and the geographical locations for which the certain types or certain qualities of tools would be required. The information in relation to the real needs of the users and the locations where the needs arise is carefully controlled by the traders for maximizing their profit in the trade.

According to the blacksmiths, the best alternative marketing method which has been tried so far is the production co-operative system. Under this system, direct links are established between the producers and users, which enable the producers to know the real needs of the users.

Another complaint made with respect to marketing was that the prices the blacksmiths get for tools are very low when compared with the market prices. It was found that in every blacksmithing community, the price of a particular tool is determined by the trader to whom the blacksmiths usually sell their products. The bargaining power of the blacksmith is relatively low as he depends very often on the trader for credit and for selling tools. Due to this situation, in most cases the blacksmith does not get any appreciable profit, or he gets only a small profit which is negligible when compared with the profit that is earned by the trader.

3.7.2 (b) Availability of Labour:

It was observed that labour is a main problem for blacksmiths in the blacksmithing communities as well as for the forges of individual blacksmiths. The shortage of labour in the blacksmithing industry is a result of three reasons, namely:

- (a) The low profitability of the industry;
- (b) The relative inferior status that has been given to the occupation of blacksmithing; and
- (c) The drudgery involved in blacksmithing.

Of these three reasons, low profitability is a result of the labour-intensive production methods that are used in the industry, coupled with the marketing system that is followed by blacksmiths at present.

The status implication has no connection with the return or production methods, and is due to historical reasons in which in the traditional Sri Lankan society blacksmithing was considered as a service obligation to be performed by the people of Nawandanna (or Achari) caste to the superior Govigama (farmer) caste people. However, in the accepted caste hierarchy of the Sri Lankan society, the blacksmiths or Achari people are not considered as lowest. Their position in the caste hierarchy is somewhat higher or superior than that of castes like Nakathi, Hena, Kumbal, etc. In fact, the blacksmiths believe that they are decedents of the "Vishwa Karma" who, according to legend, is the creator of the world. However, even today, blacksmiths themselves accept that they are in a lower social position. Due to the fact that the work involved in the cottage blacksmithing industry are tedious, many people of the blacksmithing caste do not wish to remain in the industry.

The elders who already engage in the industry do not wish to train their sons in this occupation. The young people of the blacksmiths caste prefer to engage in employment like goldsmithing, motor mechanics, welding work, etc., which they consider as more prestigious and less strenuous than blacksmithing.

These economic, social and technological factors have had a negative influence on blacksmiths, especially the younger generations, in continuing with the blacksmithing industry. It could be seen that in blacksmithing communities like Parawahera and Epalawa, young smiths are migrating to urban centers in search of alternative employment. It was also found that some of the blacksmithing communities, e.g. Acharigama in Narammala (in the Kurunegala district), Wattegama (in the Kandy district) have virtually ceased to exist, since the younger generations have shifted to alternative employment. In Acharigama, the people of the younger generation have chosen alternative employment like carpentry, motor mechanics, agriculture and light engineering. The situation in Parawahera is the same, where the younger generation of blacksmiths is migrating elsewhere searching for other modes of employment as motor mechanics, welders, goldsmiths, etc. According to the findings of this study, blacksmithing will soon disappear from the Hambantota and Matara districts also (or the Southern Province as a whole) due mainly to the shortage of labour. This has already happened in the districts of Anuradhapura, Kurunegala, Galle, Kalutara, Matale and Puttalam.

However, one of the interesting findings of the study was that the rigid social barrier, i.e. caste, has been weakened in some places such as Kochchikade and Epalawa, where a person of the Govigama caste and a person of the Wahumpura caste have entered the blacksmithing industry. This can be considered as a positive trend because it encourages the people of non blacksmithing castes to enter this industry. The few young blacksmiths who are still remaining in the industry say that the shortage of labour will not be a problem if there is a programme to help the blacksmiths to modernize their workshops. They said that young people will enter the industry if the traditional forges can be transformed to a modern workshop. This includes improving the existing technology and diversifying the range of products.

Similarly, it was found that the blacksmiths or people of other castes can be directed to blacksmithing if there is a programme to give a training on the practical aspects of the industry. The blacksmithing training course which is available at the Industrial Development Board (IDB) center, Pannala, covers mainly the theoretical aspects (e.g. quality control) of the industry. Therefore, a well prepared training programme for youths (selected from both blacksmithing and non-blacksmithing communities) will be an effective method to encourage them in this industry. This training course should cover subjects areas of blacksmithing, welding and fitting as these subjects are the main interests of most of the blacksmithing families.

3.7.3 (c) Technology:

The technology which is in use at present is entirely based on manual labour, so that productivity and profitability of the industry are kept very low. An improvement of the techniques of the tools which are used in the process of production is unlikely to take place entirely at the initiative of the blacksmithing communities; in other words, it will require an outside intervention. The blacksmiths, especially those who produce at a commercial scale, believe that the profitability of the blacksmithing industry can be increased if there is improved technology which can be used for forging and finishing of goods. The blacksmiths in Mawatura (Kothmale) and Epalawa (and Weboda also) are aware about the power hammer technology, but they have only been exposed to the IDB belthammer, which costs about Rs.80,000.00. Some of the blacksmiths in Mawatura and Epalawa are very keen about a low cost power hammer, but it is difficult to assess whether the two power hammer models available with ITDG will meet their requirements. However, labour is a critical problem in both blacksmithing communities as well as in the workshops of individual blacksmiths. Due to this situation, one of the requests made by blacksmiths was assistance to

encourage people in blacksmithing. The majority of blacksmiths (18 out of 28) interviewed said they would like to be able to increase the production and profitability of the industry rather than shift to another product or occupation like welding or motor mechanics. Their main request was assistance to modernize the existing forges. This means that they need assistance to increase the efficiency of production. A low cost power hammer will offer a partial solution to this problem, but this is not regarded as a priority by a majority of blacksmiths. Equipment like grinders, welding plants and blowers were stated as the top priorities of those blacksmiths. At the same time, they requested assistance to find out markets for their products, and to obtain raw materials at subsidized prices.

The above indicates that a technological solution alone will not be sufficient to change the existing situation of the cottage blacksmithing industry in Sri Lanka. It should be a package of solutions that includes technology, awareness building, training in business skills and strengthening of the organizational capacity of the blacksmiths.

The following are the priorities of each of the blacksmithing communities which were visited in this study.

Community	Priority
(1) Mawatura (Kothmale)	I Technology
	II Raw materials
	III Market
	IV Training
(2) Epalawa	I Raw materials
	II Technology
	III Market
	IV Training
	V Organization

Community**Priority**

(3) Bandanagala	I	Market
	II	Raw materials
	III	Training
	IV	Technology
	V	Organization
(4) Parawahera	I	Market
	II	Raw materials
	III	Training
	IV	Technology
	V	Organization
(5) Puwakdandawa	I	Market
	II	Raw materials
	III	Training
	IV	Technology
	V	Organization

(text: 6005 words.)

4.0 Use of Metal Implements and Its Impact on Blacksmiths

The foregoing discussion on demand and supply of metal implements have raised number of issues that needs to be given serious thought, if the blacksmith industry is to sustain as a economic venture.

4.1 Demand Situation

As mentioned in chapter two there are still number of metal implements both agricultural and domestic produced by blacksmiths. In the agricultural sector, the sickle, Heewala in the plough, forlks in vegetable cultivation and the three manna in toddy tapping are few of the implements produced exclusively by the blacksmiths.

In the paddy sector the largest demand is for resharpening sickles. Besides this demand which is common to all paddy growing districts, there are districts specific demands. For example in Kurunegala, where more buffaloe drawn ploughs are used there is a demand for the plough Heewala. In the case of sickles there is a need to resharpen them at least once a season before harvesting. The demand on blacksmiths for this work is created, specially because the farmers wait for the last two weeks to get the sickles sharpened. In vegetable production and tea plantations, the forlks are in great demand. That too the users prefer the forlks produced by Kothmale blacksmiths to the langlo or the imported forlk. In vegetable farming, 100% of the farmers prefer the Kotmale forlk though it is almost twice as expensive as the langlo forlk. During the survey, the largest demand for metal implements was observed in the toddy industry. As this is a very efficient industry in th southern coastal belt, the requirement of manna for tapping is very high. As a skilled tapper can tap 90-100 trees per day the use of manna are very intensive. Thus, the tappers have to purchase a new set of mannas every season to be competitive in the market.

The high seasonal demand on the tapping manua have created a competition among blacksmiths to produce these implements. Thus, in certain cases the blacksmiths to produce themselves visit the toddy merchants to secure their orders.

Of the metal household domestic tools, the manua is the most widely used implement, be it in the rural or urban households. Till such time the Sri Lanka palet changes from natural coconut milk to an artificial flavour in culinary preparations the manua will be an essential item in all kitchens or in "pantries", irrespective of standard of living and the type of dwelling. This demand can positively increase with increase in population and with the new concept of "shelter for all by year 2000". A similar type of a demand on agricultural implements could have been rising with increasing land fragmentation, where the number of owners to a piece of land increases with subsequent generations or when given as dowry in marriage of daughters. However, this could have a deterring effect on the demand too. With increase in land fragmentation there is an inevitable decrease in land size. Thus the extent of implement usage decreases, therefore the wastage of implements reduces. This turn of events could possibly push the life span of agricultural implements creating a negative impact on demand.

In agricultural operations, except for the mammoties and in some cases forlks all other implements are manufactured by blacksmiths. If so, there should be a growing demand for blacksmith produce, but the reality is different. Most of these metal implements are manufactured by good quality steel-alloy. To ensure quality, users always prefer to place their orders rather than buying already made implements. This creates an artificial demand on blacksmiths. The quality standard mentioned and preferability pattens of users have increased the life span of most of the implements. Thus the demand is staggered. Therefore it is evident that these blacksmiths play a very vital role in the village economy. In the absence of the

blacksmiths all the agricultural equipment (with exception of mammoties and in some instances forlks) will be out of market for the farmers. Thus, if farming is to be continued in Sri Lanka (being an Agricultural Economy) these implements will have to be imported. It is impractical and time wasting, even to think of a such an idea. Though the mammoty is usually considered as an implement not made by the balcksmiths, the mammoties used by farmers in N'Eliya is exclusively made by the balcksmiths themselves. Besides manufacturing new implements, almost all the resharpending of implements and in some cases modifying implements (i.e use of modified mammoties in chena cultivation in Hambantota) are essentially done by the balcksmiths. In the plantation and vegetable sectors too, with the exception of the mammoty all other implements are manufactured by blacksmiths. Therefore these blacksmiths make tremendous impact on the rural farm economy and can make an equal impact on the countries agricultural economy and food production.

With the improvement in quality, longitivity and durability of implements, life span of implements too increase. Thus the frequency of purchasing new implements decreases. However, most of these implements have to be resharpended during the cultivation season. Except for small-scale Kithul tappers of Kotmale all other metal tool users visit village blacksmiths to get their implements resharpended. Thus, creating a demand on blacksmiths, though it does not bring sufficient economic returns.

4.2 Supply Situation

From the above discussion, it is evident that there is a demand on blacksmiths mainly for sharpening implements and to a lesser extent for new implements. The situation of the blacksmiths at present is, that they cannot supply this demand though the available technology is adequate. The main reason for this situation is lack of skilled

labour in the blacksmith industry. Usually a blacksmithery require 3-5 skilled labourers to meet the mandane demand. But at present most blacksmitheries employ 1-2 skilled labourers besides the owners. Under the present situation most of the young blacksmiths leave smitheries to more advance welding workshops. This could be attributed to better economic gains as well as better social status. As a result of the labour shortage some blacksmiths produce implements with iron rather than with iron alloy (wane) because foreging is easier with the former. Also the implements made out of iron are less expensive than the wane implements. The shortage of labour has posed a considerable threat to manufacturing forlks, crow-bars, manna etc. This is evident in Parawahera, Appalawa, Weboda and Kotmale.

Another major reason for lack of skilled labour arise from out migration of the second generation. In most blacksmith communities (villagers) the second generation has migrated from the profession. Prior to 1977 there was a good market for all blacksmith produce through an organized marketing network, thus the returns were good and there was an incentive to be in the industry. At present most blacksmiths do not get the real value for their produce. Thus, the profit margins are very small, incidently most of the blacksmiths in blacksmith communities live on food stamps. These reasons have forced the second generation out of this traditional industry. However, according to the survey findings, if new technology (like grinding wheels, blowers) can be introduced with an organized marketing network, there is a possibility of retaining the second generation in the industry. Infact the traditional belief of blacksmithing is caste specific occupation is fast becoming history. The survey identified at least two blacksmiths from Govigama and Wahumpura caste in Kochchikade and Epalawa. Thus the economic situation has overridden the caste biasness in the blacksmith industry. However, the situation with regards to individual blacksmiths are much different to their counterparts in blacksmith villages (communities). Here, the blacksmiths cannot find skilled labour as the proprietors cannot pay

them adequately. The second generation of these blacksmiths have migrated to other skilled occupations. (i.e. as motor mechanics and welders). Add to this problem, the individual blacksmiths are faced with the problem of high cost of raw material.

The cost of a kilo alloy steel (wane) is Rs. 15/- at present, while it was just Rs. 8/- some 5-7 years back. The cost of charcoal has also increased to Rs. 14/kg and to manufacture a knife one needs 1-2 kg of charcoal. Earlier there were charcoal traders who use to supply most of blacksmith needs but at present with the emphasis on environmental protection, less natural forest are cut for charcoal. Therefore the present blacksmiths have to depend on coconut shell charcoal, which has to be bought from the open market. Incidentally the shortage of good quality steel is having a greater impact on blacksmith villages than individual blacksmiths. In the case of the latter they can find their requirement from the village or the nearest township as their needs are lesser due to low demand on implements. But in case of blacksmith communities, they find it difficult to meet the demand with the non-availability of good quality steel. As their requirements are high, they cannot purchase sufficient quantities of good quality steel from retail markets. The main cause for the shortage is again the open economic policy adopted by the state. Prior to 1977, most blacksmiths got their quota of steel from the Ceylon Transport Board and Ceylon Government Railways. Since the liberalized economy and specially after the peoplisation, most of the steel is exported as scrap iron. Thus denying the blacksmiths of the valuable raw material.

With the present open market economic policies, It will be extreamly difficult to interfere in the export of scrap metal. The only option available for blacksmiths however, is to organize into a strong society. These society once organized can be registered under the respective divisional secretaries. Thus they become legal bodies with authority. These bodies should be able to seek assistance under the

Janasaviya self-help scheme to purchase raw-material in bulk. This way they should be able to get a regular supply of raw material at a concessionary rate. However, all this change can not be expected from blacksmiths alone. A facilitator from the state sector or from a NGO, who is acceptable to the local authorities should be employed to assist the blacksmiths to get the above process stream lined.

Marketing is one of the most important factor for the sustainability of blacksmiths. The existing market is rather invisible. According to demand statistics there should be a high demand for their products, if so they should exhibit better living standards. But the reality is otherwise. With regard to blacksmith villages, their products are sold throughout the country by intermediaries. In most cases these intermediaries make as much as 40-80% profit on metal implements produced by blacksmiths. Thus, lack of direct contact with the customers have opened the blacksmiths to exploitation by intermediaries. One of the main reasons cited for the disintegration of individual blacksmiths is the poor market. Here the reference is for low demand on metal implements and the present market monopoly by blacksmith villages. During the pre '77 era, there were blacksmith societies, which acted as the intermediaries in marketing their produce. This mechanism brought the producer and the buyer in direct contact, thus getting the monies worth for their products.

These societies besides getting directly involved in marketing, looked into raw material supply and blacksmith welfare. Thus the system functioned well with adequate economic and social benefits to blacksmiths. The introduction of liberalized economy witnessed the gradual decline in these societies and at present it is totally non-functional. Therefore the blacksmiths have no recourse if any injustice is done to them or to their products in the open market.

5.0 Conclusions and Recommendations

5.1 Conclusions

clear
It is imperative that the Sri Lankan agricultural sector is still largely dependant on blacksmiths to supply most of its tools. Except for the mamoty and in some cases the forlks, rest of the implements are produced by blacksmiths. More than the need for new implements, almost all the resharpening of metal implements are done by blacksmiths. Thus, blacksmiths are a part and parcel of agricultural life in Sri Lanka.

Non-existance of a proper marketing network is considered as one of the biggest drawbacks for the present blacksmith industry. It appears that there is a degree of market ignorance among blacksmiths even in blacksmith communities. This has led to market exploitation by intermediaries resulting in low profits to blacksmiths. This has become the *of the main* sole reason for most people to leave the industry. Out migration of the second generation blacksmiths can also be attributed to this reason. There is evidence that the blacksmithing industry is not getting restricted to one specific caste. People of other castes have been seen getting into blacksmith industry due to economic reasons. Low net returns to blacksmith produce have created a dearth of blacksmiths specially in place like Kurunegala under minor irrigation. However, in places like Polonnaruwa under major irrigations, there is demand for blacksmiths as they have little time to attend to blacksmith work due to their full time employment in paddy farming.

The existing technology among blacksmiths is sufficient to be in the market but in a high demand (specially during harvesting season in paddy and toddy tapping season) competitive market blacksmiths may need new technology.

Technology could improve the quality of blacksmith products specially, as sighted in toddy tapping. Thus, specific technology to specific locations could improve the quality and production of metal implements.

At present most blacksmiths are faced with the problem of raw-material, specially good quality steel and charcoal. The impact of this problem is acute with the blacksmith communities than with village blacksmiths. The post 1977 economic liberalization policies have been the main course for the shortage in raw material, specially good quality steel. However, the non-availability of charcoal is a result of environmental protection policies adopted by the present policy makers. The post 1977 policies have also effected the organized market structure through blacksmith societies, which existed prior to 1977.

Thus, in future there is a tendency to disintegrate village individual blacksmiths industry causing great hardships to the farming population specially with respect to resharpening agricultural implements. However, in places where metal implements are in high demand, i.e. in Wadduwa, Kalutara area due to toddy industry, the individual blacksmiths will continue to function. According to the present situation few of the existing blacksmithing villages will continue to flourish while blacksmithing villages like Bandanaqala Parawahera will cease to exist after the present generation of blacksmiths.

5.2 Recommendations

1) There is a need to introduce new technologies to blacksmith communities. However, this should be done after an indepth study of each blacksmith community. According to the present survey, the introduction of new technologies should be area specific. This study

identified the need of new technologies specially to ease forging operations in manufacturing of forklifts with rail tracks in the Kotmale blacksmith community and in the toddy industry, where tapper complained that the sharpness of metal implements used vary due to the inability to maintaining a constant heat among blacksmiths using the traditional blower (Minahama). Thus, an introduction of mechanical blowers could improve the quality of the implements. Though this was reported only by the toddy tappers (where the need for sharp implements are mostly felt) it could hold true to many other metal implements as well. In certain instances blacksmiths have identified grinders and welding plants to improve the quality of their produce. Thus, the needy areas and blacksmiths have to be identified alongwith the demand for metal tools in these areas before introducing the technology.

2) The introduction of new technology should be presented as a package with pre-awareness and training programmes, followed by a continuous monitoring programme to assess the performance and quality of products.

3) At present most blacksmiths attribute new technology to the IDB belt-hammer. The approximate cost of this is Rs. 80,000. Thus, the blacksmiths have a natural tendency to reject the power hammer technology on cost aspects. This obsession on the IDB beat-hammer and the tendency to relate its cost to new technology should be removed through awareness programmes on available new technologies for small-scale blacksmithing industry and their related cost structures.

4) As marketing of blacksmiths products is considered as a key constraint, an effort should be made to ^{more} streamline the marketing channels of these products. As a preliminary step the blacksmith communities should be organized to form blacksmith societies. Once this is done all marketing could be channelled through the societies.

In the paddy sector this can be easily done as most of the paddy farmers under major irrigations are now organized at system level.

Thus the blacksmith societies can get in touch with the system level farmer organizations to supply their demand for the entire irrigation scheme. This way the blacksmiths can be assured of a better price for their products, specially in the absence of intermediaries.

5) The blacksmith communities should be given periodic training on the available marketing systems, marketing channels and they should be aware of the existing demand-supply situation for their products. This could avoid over production or under production of specific implements. Also, it can warn the blacksmiths of critical demand periods for new tools and sharpening old implements i.e. sickles in paddy production. If this information is available the blacksmiths can be prepared with extra labour to provide a better and an efficient service to the users.

6) The IT should publicise its programmes and plans (in Sinhala/Tamil) on introduction of new technologies among the blacksmith communities. This task could become easy once the blacksmiths are organized. These publications should detail out IT's capabilities in technology dissemination, proposed plans and intended training programmes for blacksmiths.

7) As far as possible the new equipment introduced should be able to perform most of the functions of the particular activity. For example, in the case of the power hammer, besides forging it should be modified to perform shaping of metal tools. If the latter activity has to be done in the normal manual way, the blacksmiths would soon reject the new innovation.

8) Though the present study surveyed 6 districts, the data pertaining to demand-supply of metal tools are incomprehensive. Thus it would be appropriate to make an actual assessment of demand and supply of both domestic and agricultural metal based implements for at least four agricultural seasons. Depending on time and resource availability this should cover the most important sectors with respect to metal implement usage. i.e. paddy farming (both under major and minor irrigation), vegetable farming, toddy tapping etc.

9) The IT should develop a mechanism to generate information on demand-supply situation of metal implements from blacksmiths themselves. This could be done through participatory monitoring system, which can be introduced to blacksmith communities. Its vital at this stage to make the blacksmiths realise the value of such an exercise for their own benefit.

5.3 Specific Recommendations

Technology

- 1) Kotmale and Apalawa blacksmith villagers should be provided with new technology. This should not be only restricted to the power-hammer but for grinders, welding plants etc. The Wadduwa/Kalutara individual blacksmiths could be provided with mechanical blowers to maintain a uniform heat in forging operations. This intervention should be specific only to Wadduwa/Kalutara are a where the blacksmiths have a big demand due to toddy tappers.
- 2) Introduction of new technology should necessarily be followed by a awareness and a Training Package.
- 3) As far as possible the new technology should be self contained

Training

- 4) Blacksmiths should be given periodic training on. theoritical and practical aspects of the blacksmith industry. Practical aspects should specially emphasis the market potentials and availability and procument of raw materials.
- 5) IT should collaborate with the IDB in improving the existing training course for blacksmiths. More practical aspects should be included in this course. The duration of the course should be atleast two weeks.
- 6) IT should publisise the new training programme among blacksmith villages.

Marketing

7) Marketing of metal implements should be channeled through organized blacksmith societies.

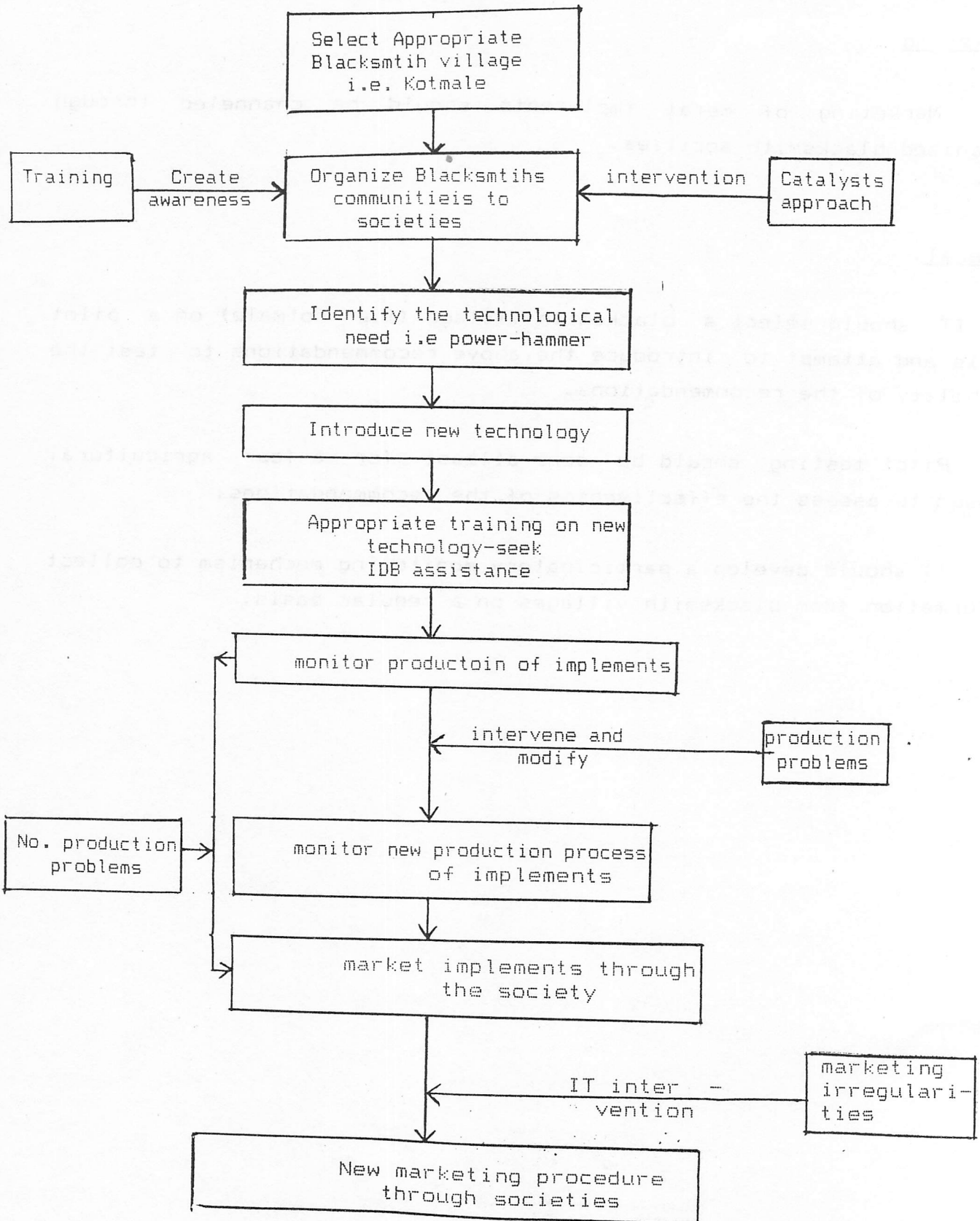
General

8) IT should select a blacksmith village (i.e Kotmale) on a pilot basis and attempt to introduce the above recommendations to test the viability of the recommendations.

9) Pilot testing should be done atleast for a four agricultural season to assess the effectiveness of the recommendations.

10) IT should develop a participatory monitoring mechanism to collect information from blacksmith villages on a regular basis.

6.0 Proposed Action Plan for IT to work with Blacksmiths



ANNEXURE I

Approximate life span, Preferability and Demand of
Metal Implements (Summary Table)

District/Crop	Metal Implement	Approximate life span (Range) Yrs.	Preferability	Demand (percentage)
Polonnaruwa/ paddy	mammoty	1 - 5	Imported	60
	Sickle	2 - 3	Local	40
		2 - 10 once a season -> 10	Imported Local	10 90
Mahaweli/ paddy	mammoty	once a season-5	Imported	50
	sickle	once a season-3 2 - 8	Local Local	50 100
Kurunegala/ paddy	mammoty	once a season-10	Imported	17
		once a season-10	Local	82
	plough (Heewala)	5	Local	100
	sickle	1 -> 8 once a season-15	Imported Local	30 70
Matara/ paddy	mammoty	2 -> 10	Imported	58
		3 -> 10	Local	42
	sickle	4 -> 15	Imported	29
		4 -> 15	Local	71

N'Eliya/ Vegetables	mammoty	once a season->4	Imported	60
		2 - >10	Local	40
	forlk	over 10	Imported	10
		over 10	Local	90
	mammoty forlk (Parimullu)	2 - >10	Local	100
Matale/ MEC Kegalle	mammoty	2 ->10	Imported	22
		2 - 10	Local	78
	Prunning knife	>10	Local	100
	forlk	>10	Local	-
	long knife/ keki knife	>7 - 8	Local	100
Matara/ cinnamon	Kaththa	6 ->15	Local	100
	Kokaththa	6 ->15	Local	100
	Piththela	6 ->15	Local	100
	Polla			
	Pealing knife	6 ->15	Local	100
	Scissor	6 ->15	Imported	100
Kalutara/ Toddy	Koku manna	once a season	Local	100
	Sinhala manna	once a season	Local	100
	Ath manna	once a season	Local	100
Kotmale/ Kithul	malpihiya	5 ->15	Local	100
	Niyana	>15	Local	100
Matara/Tea	mammoty	>10	Local	90
		>10	Imported	10
	Prunning knife	>10	Local	100
	Levelling knife	>10	Local	100
	Forlk	>10	Imported	100

Matara)	Rubber	3	Imported	10
)Rubber	latex			
Kegalle)	knife	3 ->15	Local	90
	mammoty	3 ->15	Local	100
Hambantota/ chena	mammoty	once a season- 2	Local	66
	Kaththa	2 - 3	Imported	33
		1 - 5	Local	100
	Kurahan kaththa	3 -10	Local	100
Karant	Local			
Rubber	Local			
latex				
knife	Imported			
Crow	Local			
Kurahan	Local			
kaththa				

ANNEXURE II

Actual Demand and Frequency of Purchase of Agricultural
Metal Implements within the Sample (Number Reporting)

Implement	Local/imported	once season	once a year	2-5 yrs.	>5 yrs.
<u>Paddy</u>					
Mammoty	Local (langlo)	03	06	12	02
	Imported (kimbula)	01	05	13	05
Sickle	Local	02	01	19	16
Plough	Local	-	04	06	01
Manna	Local	-	-	01	-
Rake	Local	-	-	01	01
<u>Vegetables</u>					
Mammoty	Local	04	-	04	01
	Imported	01	-	13	01
Forlk	Local	-	-	03	17
	Imported	-	-	-	02
Mammoty forlk	Local	-	-	02	13
<u>Other crops</u>					
Mammoty	Local	01	-	11	16
	Imported	-	-	03	02
Sickle	Local	-	01	-	02
Prunning knife	Local	-	-	-	12
Forlk	Local	-	-	-	02
	Imported	-	-	-	05
Keki knife	Local	-	-	-	03
Long knife	Local	-	-	-	02
Kaththa	Local	-	01	02	10
Pithala	Local	-	-	-	09
Polla					

Kokaththa	Local	-	-	-	09
Cinnomon	Local	-	-	-	09
knife	Imported	04	-	-	05
Scissor	Local	-	-	-	05
Sinhala	Local	05	-	-	01
manna	Local	-	-	-	08
Ath manna	Local	-	-	-	05
Malpihiya	Local	-	-	-	06
Niyana	Local	-	-	-	01
No.7 knife	Local	-	-	03	01
Levelling	Local	-	-	-	01
knife	Local	-	-	-	01
Karandiya	Local	-	-	03	01
Rubber	Imported	-	-	-	-
latex	Local	-	-	-	-
knife	Local	-	-	-	-
Crow bar	Local	-	-	-	-
Kurahan	Local	-	-	-	-
keththa	Local	-	-	-	-
Total		21 (6%)	18 (5%)	97 (30%)	182 (57%)

2.9 Toddy Industry

Toddy tapping is a lucrative business distributed mainly along the coastal belt from Wadduwa to Hikkaduwa. In the toddy industry the coconut inflorescence is tapped to collect toddy. Most of the coconut land in the coastal toddy belt are exclusively used for toddy production and not for fresh coconut or copra. The usual toddy season is from March to December. Thus it becomes more profitable to use the coconut cultivations for toddy than for fresh coconut.

The toddy tappers are usually the labourers hired by the toddy merchants. Some of the big time merchants employ as much as 40-50 tappers for toddy production. A skilled tapper can tap on the average 90-100 coconut trees per day. These tappers are paid Rs.1.32 per liter of sap collected, thus on an average day they can earn between Rs.150/- - Rs.300/-.

The tools used in this industry are all manufactured by local Blacksmiths. These tools are:

- i. Kokumanne (කොකුමන්න)
- ii. Sinhala Manne (සිංහල මන්න)
- iii. Athmanne (අත්මන්න)

The Kokumanne and Sinhalamanne are used to tap the coconut inflorescence while the Athmanne is used to clean branches and leaves in the tree so that the tappers can tap the inflorescence without any hindrance. These tools are made out of good quality alloy steel. However, due to the extensive use of these tools they have to be replaced every season. During a season the tools have to be sharpened number of times. The price of these tools vary between Rs.125/- - Rs.250/- depending on the type of raw-material used to manufacture tools.

As toddy tapping takes place throughout the season (March - December) these tools are extensively used. Therefore the tappers have to buy new tools

every season. Thus the blacksmiths have a good demand for the tools they make. In some instances the blacksmiths visit the toddy Mudalalis to get the seasonal order of tools. These Mudalalis usually employ about 30 - 40 tappers, therefore they have substantial demand for metal tools per season. It appears that there is a competition among blacksmiths to get orders from big Mudalalis. Following table gives the complete picture of metal tool usage by toddy tappers.

Table

Details of Metal tools used by Toddy Tappers

Respon- dant No.	Monthly income	Tools used	Price (Rs.)	Source of purchase	Prefera- bility	Frequency of purchase	Dist to nearest Black- smith (km)
1	400	Sinhala manne Ath manne	150 (92)	Blacksmiths	local	once a season	2.5
2	>10,000	Koku manne Ath manne	125 (92)	Blacksmiths	local	once a season	Black- smiths visit him to get orders
4	5000	Koku manne Sinhala manne Ath manne	200 (92))250 (92)))	Blacksmiths	local	once a season	3/4
5	8000	Sinhala manne Ath manne	)250 (92)))	Blacksmiths	local	usually once a season but	15

sinhala manne
can be used for
2 years

Figures in parantheses are years of purchase
1 Toddy season is from March to December

Some tappers have been complaining of the sharpness of the metal tools manufactured by blacksmiths. They say that as blacksmiths cannot maintain a uniform heat in the process of making these tools, the tools differ in their sharpness. Thus, it could be inferred that if technology can be introduced to maintain a uniform heat in the process of manufacturing metal tools in toddy industry, the quality of these tools could be improved.

2.10 Kithul Industry

Kithul is a traditional industry mainly geared for production of Kithul treacle and kithul jaggery. However, besides these two main produce, kithul toddy has also become a major produce though it is not legal. Most of the kithul tappers interviewed in Kotmale were Janasaviya recipients. Incidentally kithul tapping is not their primary occupation, they are basically paddy farmers who cultivate small plots of land varying between 1/4 - 1/2 acre. The paddy produce from these small pieces of land is primarily used for subsistence.

The kithul tappers basically use two types of metal tools. They are:

- 1). Malpihiya (මල්පිහිට)
- 2). 1/4" & 1/2" Niyana (නියන)

Besides these two some tappers use what they call the No.7 knife. The Malpihiya is used for splitting the inflorescence while the Niyana is used for cutting the inflorescence to embed the "native concoction" to stimulate sap secretion. The "native concoction" is made out of 250 gr. of chillies,

50 gr. of ginger, 50 gr. of mustard and a pinch of pepper. A skilled tapper can tap approximately 10 trees per day but the average for a tapper is about 5 trees. Most of the tappers purchase their tools from village individual blacksmiths. According to the Kotmale tappers, the Kotmale blacksmiths village provided most of the needed tools before the Kotmale reservoir was constructed but now they find access to the blacksmith village difficult as they have to cross the Kotmale reservoir to get to the blacksmith village.

The demand for these tools are minimal as the tools can be used for 5-10 years once made. Sharpening of these tools are usually done by the tappers themselves. As shown in the table below the distance tappers have to travel to the nearest blacksmith varies from 3/4 - 8 km. This can be quite a distance if the services of blacksmiths are required at short intervals. However, this does not arise in this case as tappers use the tools for a long time and do their own sharpening.

The following table illustrates the status of kithul tappers and their usage of metal tools in Kotmale.

Table

Details of Metal Tools used by Kithul tappers
in Kotmale

Respon- dant No.	Monthly income	Tools used	Price (Rs.)	Source of purchase	Prefera- bility	Frequen- cy of purchase	Dist. to nearest Black- smith (km)
1	3500	Malpihiya	80(92)	Town traders	local	once in 3/4	3/4
1	3500	Malpihiya	80(92)	Town traders	local	once in 5 years	3/4
		Niyana	30(92)			once in 5 years	
2	2000	Malpihiya	3.50 (80)	Blacksmiths	local	can be used for long time	5
		Niyana	15(89)				
3	1800	Malpihiya	60(90)	Blacksmiths	local	once in 5 years	8
		Niyana	10 (88)				
4	2300	Malpihiya	40 (88)	Blacksmiths	local	once in 15 years.	5
		Niyana	15 (85)				
		No.7 knife	40 (85)				
5	2500	Malpihiya	20 (87)	Blacksmiths	local	once in 5 years	5
		Niyana	15 (87)			10 years	

Figures in parantheses are years of purchase.

Two of the main constraints indentified by kithul tappers are;

- a). Threat to young kithul palms by wild boar. A single wild boar can destroy upto three young kithul palms in a night.
- b). Lack of bamboo, which is used to tie to the kithul palm in order to climb the palm. It appears that the kithul palms cannot be climbed as it is without any assistance because the trunk of the palm is slippery.

2.11 Tea Plantations

The small-scale tea growers in Sri Lanka are mostly found in down South. Thus, the survey interviewed ten small-scale tea growers from Matara district. According to the scale of operation these small-scale growers earn between Rs.1,500/- - Rs.8000/- per month.

The most common metal tools used by these small-scale growers are as follows:

- 1). Mamoty
- 2). Prunning knife
- 3). Levelling knife
- 4). Karadiya (කරදිය)
- 5). Crow bar
- 5). Mullawa (මුල්ලුව) or fork

As the plantations are mostly in the acidic soils of Red-yellow podsollic great group, the soils are hard and formed of iron concretions. Therefore the small-scale growers prefer the local mamoty to the imported. The local langlo mamoty is stronger and resist breaking or bending in hard soils. The other aspect is, in tea plantation usually blunt mamoties are used to avoid soil eroision.

The prunning and levelling knives are the other two important tools used. Both these are usually turned out by the Blacksmiths. Most tea pluckers

carry a levelling knife to cut-off any branches that is protruding from the levelled tea bush. In certain cases the small-scale grower does not own these tools, he would hire persons for the job who own these tools. According to the small-scale growers best pruning and levelling knives come from Kothmale and Koslande.

The Karandiya is the other locally turned out tool that is used in tea plantations to clear thinly grown shrub jungle. The Mulluwa or the forlk is a tool used to loosen the soil before fertilizing, specially during tea seedling stage, thus the forlks are not extensively use in tea plantations. The forlk that is being used is the unwelded one. In other words it is one single metal piece thus resists breaking and lasts for a long time. The local forlk according to the growers are welded, therefore are prone to damage specially in hard tea soils. The crow-bar which is used by some to uproot old plant roots and loosen the soil are usually imported ones bought from traders in the cities. However, some growers have got their crow-bars turned out by blacksmiths giving them iron bars. In such cases it had cost them Rs.400/- and have to sharpen at least every six months.

Thus, according to the survey findings, except for the forlk and in some cases the crow-bar, all the other tools are local ones. Out of these the mamoty is being bought from city traders while the rest, pruning and levelling knives and Karandiya are manufactured by Blacksmiths. All these tools in tea plantations can be used for a long time, at least 5-10 years thus, the necessity of buying new tools does not arise too often. The users prefer the Kothmale and Koslande pruning and levelling knives to locally (village level) turned out ones. The only time the users go to village blacksmiths are when they have to sharpen their tools specially pruning or levelling knives. The following table presents a complete picture of the metal tool useage in small-scale tea plantations in Matara.

Details of metal tools used by small-scale
Tea growers in Matara district

Respon- dent	Monthly income	Tools used	Price (Rs.)	Source of purchase	Prefera- bility	Frequency of purchase	Dist. to nearest Black- smith (km)
1	2400	Mammoty	90(86)	Traders)	can be used for a long time	3 1/2
		Prunning knife	30(88)	)Blacksmiths	)local
		Levelling	10(88)))		
2	8000	Mammoty	115(89)	Traders)	can be used for long time	3
		Levelling knife	15(86)	Blacksmiths	)local	
		Fork	-	Traders	imported		
		Karandiya	20(90)	Blacksmiths	local		
3	3500	Mammoty	Does	Traders)	can be used for long time	1/2
		Prunning knife	not own	)Blacksmiths	)local
		Levelling knife	tools hire them))		
		Fork	with labourers	)Traders	)imported
4	3800	mammoty	-	Traders)local	10-15	-
		Prunning knife	60(89)	)Blacksmiths)	
		levelling knife	25(88)))		
		Fork	95(78)	)	)imported

		Crow-Bar	90 (85)	)Traders		
5	3750	Mammoty	)can't )	)	can be	3/4
		Prunning knife	remember)	Blacksmiths)	local	used for long
		Levelling knife))		
		Fork	)Traders	)imported		
6	7500	Mammoty	150 (89)	Traders	)	can be 5
		Levelling knife	60 (88)	)Blacksmiths	)local	used for for long
		Prunning Knife	15 (85)))	
		Fork	v.old	Traders		
		Karandiya	20 (90)	Blacksmiths)	
7	1500	Mammoty	-	Traders	)local	can be 3 1/2
		Running knife	40 (84)	)Blacksmiths	)	used for long time
		Levelling knife	12 (85)))	
8	4300	Mammoty	95 (77)	Traders	)local	Approx 3/4
		Karandiya	120 (80)	Blacksmiths	)	10 yrs.
9	2600	Mammoty	-	)	)	can be 6 1/2
		Prunning knife	60 (86)	)Traders	)Local	used for long time
		Levelling knife	10 (84)	)Blacksmiths)	
		Karandiya	25 (92)	)	)Local	
10	3400	Mammoty	85 (81)	)	imported	can be 3/4
		Karandiya	15 -	)Blacksmiths	local	used for long time

Figures in parantheses are year of purchase

2.12 Metal Implement Usage in Rubber Industry

To assess the use of metal tools in rubber industry ten small-scale rubber growers were interviewed from Kegalle and Matara. Most of these small-scale growers had 1-2 acres of rubber with the exception of one, who had 10 acres of Rubber and 1/8- 1 1/2 acres of paddy lands. The harvests from paddy was mainly used for subsistence while the rubber gave them the extra income for survival.

The two most important metal implements used in rubber growing are the rubber latex knife and the mamoty. The former is used to tap rubber trees while the latter is commonly used for cleaning weeds and undergrowth whenever necessary. The rubber latex knives presently available in the market are from blacksmiths, manufactured by State Training Corporation and imported from China. The olden rubber latex knife, which was commonly called the "pipe brand" was an English made. This particular brand is still being used by some tappers and they are as old as 25 years in some instances. The "pipe brand" knives have a good cutting edge, resist immature wasting and wouldn't damage the bark of the tree when tapping latex. However, in the absence of this knife in the market, tappers have got used to the latex knives made by blaacksmiths and locally (STC) turned out ones. Bet ween these two manufactures, the knives produced by blacksmiths lasts longer than the STC knives. Tappers who used blacksmith's latex knives were mainly from Kegalle (within the sample). Besides the two local knives and the "pipe brand" knife, there is a Chinese latex knife in the market which is not prefered very much by the tappers. This is evident in the price of the two items as well. While the Chinese knife is Rs. 55/- the local knife is Rs. 65/-. Thus, the preference in the absence of "pipe brand" is positively for the local latex knife. A usual latex knives lasts for approximately 3-4 years. However, the knives have to be sharpened many times within this period.

However, one of the distinctive advantage of the pipe brand knives over the local one is, in the former one Kirimuwa a) special form of sharpness can be kept while this is not possible in the local knives.

The details of metal usage by small-scale rubber growers are given in table 2.

Table : Details of Metal Tool Usage by Rubber Growers in Kegalle and Matara District

Resp. No.	Monthly income	Tools used	Price (Rs.)	Source of purchase	Preferability	Frequency of purchase	Dist. to the nearest black-smith (km.)
1	3900	Rubber latex knife mammo- ty	38 (90)	Traders	local	5 yrs.	-
2	3500	Rubber latex knife mammo- ty	25 (88) 90 (78)	Traders	local	5 yrs. 10-15 yrs.	-
3	4200	Rubber latex knife mammo- ty	- 180 (88)	black- smiths Traders	local	10 yrs.	1 1/2
4	4200	Rubber latex knife mammo- ty	60 (87) 175 (90)	Traders	imported local	5 yrs. 3 yrs.	-
5	2600	Rubber latex knife	10 (73)	black- smiths	local	10 yrs.	1/2
6	20,000	Rubber latex knife	62 (87)	black- smiths	local	10-15	1/4

7	3500	Rubber latex knife mammo-ty	65 (90) 150 (86)	black-smiths Traders	local local	3 yrs.	8
8	2000	Rubber latex knife mammo-ty	55 (82) 55 (80)	Traders	local	7 yrs.	1 1/2
9	3300	Rubber latex knife mammo-ty	50 (90) 160 (90)	Traders	local	3 yrs. 3-4 yrs.	1 1/2
10	2500	Rubber latex knife mammo-ty	60 (90) 140 (86)	Traders	local	4 yrs.	1/2

2.13 Usage of Metal Implements by Vegetable Farmers in Nuwara-Eliya

The survey interviewed 25 vegetable farmers from N'Eliya district for the usage of metal tools in vegetable cultivation. These farmers grow a mixture of vegetables including Carrots, Leaks, Potatoes, Cabbage, Beet Letuce etc. However the main crop that brings good economic returns is potato. These vegetable farmers cultivate between 1/2 acre to 10 acres depending on the economic standings of the farmers. The large scale farmers (more than 4-5 acres) employ labourers to work in the fields while small-scale farmers do not employ any hired labour for work. When labour is hired the current rate is Rs. 100/= per day with meals.

These farmers use three types of metal implements. These are mamoty, Fork, and Parimulla. All these three implements are extensively used in vegetable cultivation and the fork is particularly important in Potatoe cultivation. These farmers use both local langlo as well as the imported Kimbula mamoty. Out of the sample, 56% used Kimbula brand while the rest preferred for Langlo. Even the other imported chinese mamoty brands like Kukula and Aliya are also being used by farmers. As most of the vegetable growers are commercial farmers, they would opt for the most efficient implements. Thus, for them the Kimbula brand performs well in heavy textured day loan soils of N'Eliya. However one finds that a significant percentage uses langlo brand too. These are farmers whoses fields are located on light textured Sandy-loam soils and those who cultivate small parcels of land. One of the significant differences of vegetable farmers, is that they have to change the mamoties atleast once in two years and in some cases once a season. This is due to the extensive usage of mamoties in vegetable cultivation in N'Eliya.

The fork is mainly used for Potato harvesting and this implement was available with all the sample farmers in N'Eliya. There are two types of forlks available in the market. They are a the langlo fork and

Kotmale forlk. As for the cost of these, the former costs Rs. 390-450 while the latter costs between Rs. 700. The difference in price is due its strength and the way it has been manufactured the langlo one comes in two parts but welded together but the Kotmale forlk comes in one single piece and the latter is preferred by farmers though it is more expensive. The Kotmale forlk can be used for atleast 10 years.

The Parimella, which is a forlk version of a mamoty is being used for incorporating fertilizer into the soil. This tool also can be used for more than 10 years and is manufactured in Kotmale and sold by traders in the cities. One of these tools at present cost about Rs. 160/=. Besides these three main implements sometimes farmers use rakes to remove large stones, twigs and leaves during vegetable bed preparation. These rakes are usually turned out at the welding shops in the near by towns. Each of these costs about Rs. 75-100.

From the above discussion it is evident that vegetable farmers of N'Eliya prefer buying all metal implements from traders. The survey did not identify a single farmer who purchased tools from blacksmiths. The main reason for this preferability is the timely availability of implements from traders, adoption to tools sold by traders and dearth of blacksmiths involved in manufacturing agricultural implements. According to available information from farmers, there are less than 10 blacksmiths for entire N'Eliya district. The few who are factioing surve as non-professional mechanics for vehicle repairs, mainly dealing in turning out metal parts for minor vehicle repairs and straightening spring blades for vehicles. They (blacksmiths) too are under the impression that, it is of no use trying to compete with the city traders to supply agricultural implements as the supply of these implements in city trade stalls are more than adequate.

2.14 Metal Implement usage of Chena Farmers in Hambantota District

Five chena farmers were interviewed in Hambantota District mainly to complete the diversity of metal implement usage by different agricultural operators. The five respondents were located in very remote places like Suriyawewa, Megahajadura and Katanwewa. These farmers cultivate an extent of approximately 1 1/2 acres to 3 1/2 acres of chena land. The main crops grown in these chena ranges from maize, green gram Cowpea, Kurakan etc. These cultivations are the only means of living for these farmers and their average monthly income varies from Rs. 750-1000.

These farmers, basically use three types of metal implements. (a) mamoty (b) Kaththa (c) Kurahan Kaththa. The latter two are used for jungle clearing while the mamoty is for all purpose. Both type of mamoties are used by farmers. Those who use the imported Kimbula justified its use by saying that it is light in weight and easy to use. Those who use the langlo buys it because it is cheaper than the other as the users are mainly cultivating highlands. The mamoties, whether it is imported or local have to be changed atleast once in two years and in some instance, the users have changed mamoties once a season. The frequency of buying a new mamoty depends on the extent cultivated, nature of the soils and intensity of cultivation. Some farmers reported that though they buy the Kimbula brand for its superior cutting quality, they get it reshaped by the blacksmiths to suit their needs.

The Kaththa and Kurahan Kaththa are used by all chena farmers for cleaning operations. These tools can be used for a period of 3-10 years. However, they need to be resharpened few times atleast once a season before the chena operation commences. These implements are essentially manufactured by blacksmiths.

The purchasing sources of metal implements of chena farmers are entirely different from rest of the farmers interviewed. These chena farmers purchase all their requirements from village fairs (Pola) or occasionally from traders in the city, in which case they have to travel atleast 25-30 km. These farmers have no access to blacksmiths, as individual blacksmiths do not exist in the area. Therefore, these chena farmers have to depend on the metal implements that are sold at the Pola irrespective of the quantity. That too, after travelling a distance of 8-20 km. (depending on the location) to the Pola.

2.15 Use of Domestic Metal Implements by the Farming Community

As the Blacksmiths are not only concerned with manufacturing agricultural implements, the survey extended to inquire the usage of metal domestic implements by agricultural producers. The following analyses confines to the most frequently used domestic metal implements.

The usual domestic metal implements found in many farmers households are, the Manna, Mahapihiya (chopping knife) table knife, axe, coconut scraper, beetle nut cutter etc. All the above implements are manufactured by village blacksmiths. As in the case of many agricultural tools, villagers prefer to purchase these implements made by blacksmiths. In this order, rather in case of need they would purchase domestic tools though they are prepared not to personal order. For this reason many farmers say that, these implements are freely available with blacksmiths and village traders. In the above context, the implements referred are the Manna, Mahapihiya and the table knife. These incidently are the most commonly and frequently used domestic metal tools in the village household.

Besides these common domestic tools, there are others like the axe, bee-te-nut cutter (qiraya) coconut-scraper etc. which are common household metal tools but not frequently purchased as the tools mentioned earlier. In case of the qiraya, it will last for couple of generations, the scotting type coconut-scraper too would last for atleast 10-20 years, though resharping is required atleast once a year. The domestic axe too lasts for atleast 20 years or more. Though the axes found at present are largely manufactured by the State Trading Corporation or other leading dealers, in the olden days. These were made by village blacksmiths these, most of the axes which belonged to the sample farmers were the once made by blacksmiths. The blacksmiths do not make axes at present because the demand for this is very low. However, the blacksmiths still attend to resharping of these axes as and when a request is made.

The strong local preferability (made by blacksmiths) that exists for these implements stems from the deep-rooted cultural heritage of Sri Lanka. Traditionally these implements were made by the blacksmiths and they adhered to a certain quality standards of produce. This has been maintained over time and at present users still attribute. The superiority of blacksmith produce to its better quality, durability and availability. The best evidence for the superiority of local produce is the users preference to domestic tools in the open market.

Though most of the above discussion is centered around the rural household and its metal tool usage, there are certain specialized metal tools that are specifically made by blacksmiths in any Sri Lankan Kitchen. Here we are referring to the Manna which is used for breaking coconuts. Though so much of new sophisticated domestic tools have flooded the open market, there had been nothing so far to replace the Manna. Therefore with the increase in population there will be a growing demand for very specialized blacksmith products.

Table : Details of Metal Tools Usage by
Hambantota Chena Farmers

Resp. No.	Monthly income	Tools used	Price (Rs.)	Source of purchase	Preferability	Frequency of purchase	Dist. to the nearest blacksmith (km.)
1	-	mammo-ty	-	Traders	local	2 yrs.	07
		Kaththa	70 (89)	black-smiths			
		Kurahan keththa	2.50 (90)	black-smiths		2 yrs.	
2	-	mammo-ty	270 (92)	Traders	imported	3 yrs.	20
		Kaththa	60 (88)	black-smiths	local	-	
		Kurahan Kaththa	7 (90)	black-smiths	local	-	
3	750	mammo-ty	85 (88)	Traders	local	once a season	12
		Kaththa	40 (88)	black-smiths		1 yrs.	
		Kuraha kaththa	2 (88)	black-smiths		4-5 yrs.	
4	1000	mammo-ty	150 (89)	Traders	imported	2 yrs.	10
		Kaththa	65 (89)	black-smiths	local	3-4 yrs.	
		Kurahan Kaththa	7 (89)	black-smiths	local	3-4 yrs.	
		sickle	50 (88)	black-smiths	local	1 yr.	

5	1000	mammo-	125	Traders	local	2 yrs.	8
		ty	(90)				
		Kaththa	100	black-		5 yrs.	
			(91)	smiths			
		Kurahan	5	black-		10 yrs.	
		Kaththa	(88)	smiths			

Figures in Paranthesis are years of purchase

3.0 The Blacksmith Industry:

The small scale blacksmith industry in Sri Lanka, although it provides a wide range of tools and undertakes repair services that are essential for use in agriculture, artisanal work and at domestic level, has been almost entirely neglected over the years by development planners. Studies that have been conducted so far on this informal sector show that the tools which are produced by local blacksmiths are of a quality acceptable to the farmers and others who use them. This section of the report presents a general description and a simple analysis about the village based blacksmiths industry, with particular reference to its capacity to supply tools for agriculture, artisanal work and domestic needs.

3.1 Socio-Economic Situation of the Blacksmiths:

The local cottage blacksmiths industry is an extremely primitive operation, still being carried out according to traditional practice. The production is based entirely on labour intensive methods, and as a result, the productivity as well as the profitability of the industry remains very low.

The blacksmiths industry is considered as a caste-bound occupation in Sri Lanka, and therefore only people of the so-called blacksmiths caste (known as NAVANDANNA or ACHARI) typically engage in this industry. As a result of this social barrier, people of other castes do not like to enter this industry; also, the younger generation of the blacksmiths families is not willing to take to the industry, as they too regard it as a lower status occupation. This status implication of the industry has led the young blacksmiths to find alternative means of employment, mainly in the fields of light engineering and motor mechanics which they consider as more prestigious than blacksmithing.

On the other hand, due to this status implication and the negligence of this sector over a long period of time, no significant improvements have been made in production methods or in the technology used. Consequently, the blacksmiths who already engage in the industry have not been able to increase the productivity or profitability of their industry.

The economic status of a majority of blacksmiths is very low, and the income they earn is barely sufficient to meet the subsistence needs of the family. The factors which are responsible for such a situation are mainly the production methods which are used in the industry and the nature of operation.

The production methods used in the industry are based entirely on arduous manual labour, and therefore the labour input into the production process usually comes in short spells. On the other hand, the industry depends largely on family labour, especially of the males in a family. As such, the scope to expand the industry is very limited. The increase or decrease in the productivity is determined by the number of labour units available within the family and the number of working hours per week.

This does not mean, however, that wage labour is not used in the industry. Hired labour is also used to a certain extent, particularly by those who do not have family members to work for them. In most of these cases, hired labour is used only for a limited period, especially when the blacksmith finds it difficult to do some work without the help of somebody.

At the same time, in most places the blacksmiths undertake only repair services, or have limited their production processes to simple tools like knives, sickles, etc. Several factors have influenced this situation. Among them the most crucial factors are the low level of profitability, and the inferior status that has been given to the blacksmiths industry. In addition, the shortage of labour, primitive production methods and lack of support from outside are also responsible for this situation.

3.2 Present Situation of the Blacksmiths Industry:

As mentioned in the section one, information was collected for this study from 28 blacksmiths who are in six administrative districts.

3.2.1 Socio-economic Characteristics:

It was seen that the number of young blacksmiths who engage in the industry at present was very small when compared with the number of old blacksmiths. Out of the 28 blacksmiths interviewed, only two were in the age group of 20-30 years. Nearly half of the blacksmiths (13) were above 50 years of age. This shows that the cottage blacksmithing industry in Sri Lanka faces a problem in attracting young people to be trained in the industry. Accordingly, in the future there is likely to be a shortage of locally made tools for use in agriculture, artisanal work and domestic activities.

This situation was similar in all the 6 blacksmithing villages visited during this survey. However, a few cases were found in Mawatura in Kotmale, and Epalawa in Mawanella, where three young blacksmiths who had studied upto grade 10 were doing blacksmithing on a commercial scale. They were of the opinion that young people will enter the industry if the technology that is used at present can be improved, and also if there is a steady market for the tools they produce. There are signs of the social barrier, i.e. blacksmithing being categorized as a caste bound occupation, changing: it was found in Epalawa and Kochchikade that two young govigama (i.e. farmer) caste people had started production of tools with the help of a master blacksmith of the Nawandanana caste. This breakthrough in the caste barrier might develop into a trend in the future if there is a programme to change the present system of production, i.e. the labour intensive methods.

Such a task may not be difficult since the levels of education, especially of the young blacksmiths who are still remaining in the industry, are comparatively high. Out of the 28 blacksmiths who were interviewed for this study, 8 persons (in the age group between 20-35 years) had obtained education up to grade 10, and one person had studied up to grade 12. This trend of educating the children is evident in every blacksmithing village visited during this study. It was seen that 12 per cent of the children of 28 blacksmithing families had obtained an education up to grade 12. Another 34 per cent of children also had studied up to grade 10, and out of this number, 11 per cent of the children had qualified to follow GCE Advanced Level courses. The majority of parents, however, wish to send their children to public sector employment rather than to train them on blacksmithing or other forms of self employment.

It was seen that blacksmithing is becoming the secondary source of employment (and income?) for a considerable number of families who are already engaged in the industry. In Bandanagala blacksmithing village, for example, the main occupation of almost all the families is paddy cultivation rather than blacksmithing. Blacksmithing has become a seasonal employment for a majority of blacksmiths.

Meanwhile, some of the families have totally abandoned the industry. A similar situation was also found in Kurunegala and Hambantota districts, where the main source of income of the blacksmith families is not blacksmithing but agriculture or other kinds of self employment like carpentry, welding work, etc. The traditional blacksmithing communities which existed in these districts cannot be found any more as the blacksmiths in those communities have entered into alternative means of employment, or have migrated to other areas/villages to do engage in their traditional industry.

3.3 Production and Marketing of Tools:

The findings of this study show that the production of tools are concentrated mainly in blacksmithing communities which are found in following districts:

District	Name of the Village	No. of Families Engaged in Blacksmithing
Matara	Parwahera	37
Gampaha	Weboda	70
Kegalle	Epalawa	40
Polonnaruwa	Bandanagala	37
Nuwara Eliya	Mawatura	18
Kurunegala	Sandalankawa	?
Hambantota	Puwakdandawa	10

Although individual blacksmiths produce tools, they do not supply them to the wider market. The quantity as well as the range of tools that they produce is very limited. Accordingly, it is important to note that a greater part of the demand for tools is met by the few blacksmithing communities mentioned above.

The following list gives the kind of tools which are produced by each of the blacksmiths who were interviewed.

Items	No. of Blacksmiths who produce them
Table Knives	2
Dodol Spoons	1
Scrapes	1
Manna, Ketty, Knives	1
Sickles, Knives, Plough	2
Axes, Ketty, Pokes, Ukunudethi	1
Knives (No. 1, 2, 3, 4, 5)	2
Tractor wheels, Barrows, Knives, Sickles	1

Items	No. of Blacksmiths who produce them
Knives, Sickles, Ketty, Udunudethi	1
Knives, Axes, Crowbars	1
Knives, Poke, Crowbars	2
Knives, Crowbars, Axes, Ketty	1
Sickles, Scrapes, Mamoties, Panketty	1
Table Knives, Ketty	1
Axes, Ketty, Knives, Scrapes	1
Ketty, Axes, Mamoties, Knives, Crowbars	1
Arecanut cutters, Serapes, Sickles, Heewala	2
Crowbars, Axes, Ketty, Knives	1
Axes, Knives, Ketty, Scrapes, Heewala	2
Ketty, Adze, Mamoties, Knives	1
Crowbars, Arecanut cutters, Sickles, Polula	1
Knives, Sickles, Mamoties, Axes, Ketty, Pliers	1
Repair services only	3

	28
	=====

These blacksmiths can be categorized into six categories in terms of the number of items they produce.

Category	Number
1. One item only	6
2. Two items	1
3. Three items	5
4. Four items	6
5. Five or more	7
6. Repair services	3

	28
	=====

Of the 28 blacksmiths who were interviewed, this first category was represented by 14.

The tools that they were producing were knives, sickles, scrapes and spoons. They had opted to produce these items mainly because of the shortage of labour, and the high cost of raw materials. The labour requirement for the production of these tools is comparatively less. Similarly, the raw materials used in the production of these tools are not very expensive when compared with the raw materials that are used for hard tools.

However, although the cost of production of these tools is comparatively low, the profit margin that the blacksmith can earn from these tools is very small - sometimes negligible or none.

The number of those who were producing hard tools was 8 out of the 28 blacksmiths. The profit margin and the income of these blacksmiths is much higher than that of the blacksmiths falling into the first category. Marketing is not a problem for these blacksmiths since they produce these tools on orders. The cost of production of these tools is also correspondingly higher, as the production process requires a great deal of labour and high quality raw materials. A few blacksmiths who manufacture the rotary and mud wheels for hand tractors were also found in Polonnaruwa district. These are some of the new items that blacksmiths have started to manufacture in recent times.

Into the third category belong the blacksmiths who undertake mainly repair services. Their number was 3 out of the 28 blacksmiths interviewed.

As far as these three categories of blacksmiths are concerned, the second category is the most important from a technology dissemination point of view. This is so because

one of the needs of those blacksmiths was an improved technology that can be used to increase the present levels of productivity. Most of the blacksmiths of this category have some entrepreneurial abilities, and they also produce their tools on a commercial scale. (The blacksmiths who produce pruning knives also have these attributes). The other two categories are less important in the sense that their production is oriented towards the meeting of subsistence needs of the family, and therefore, adopting improved technology or maximizing profits is not the priority of these blacksmiths.

3.4 Production Methods:

As mentioned earlier, the technology used in the process of production is entirely based of arduous manual labour. As a result, productivity remains very low among those who produce tools as well as those who undertake repair services. The productivity, especially of workshops which produce hard tools like poke, crowbars, axes, manna, etc., is considerably low as it requires a lot of time and intense manual labour for forging.

A uniform pattern of work could not be identified in any of the places visited. However, it was found that a majority of blacksmiths work at least five days a week. Out of the 28, there were 11 blacksmiths who said they work throughout the week. They were found in Kotmale and Epalawa blacksmithing villages, while another nine blacksmiths said that they work at least six days a week. These blacksmiths are also found in blacksmithing communities. From the balance eight blacksmiths, five work four days a week, and three blacksmiths work three days a week. These latter three were found among the individual blacksmiths.

The following table is presented to show the number of days and labour units required to produce a set of selected tools.

Table 1

Time and labour requirement in the production of tools.

Tool	No. Produced a week	No. of labour units		No. of days per week
		Skilled	Semi-skilled	
Knives				
No. 3	60			
No. 5	30	2	1	7
No. 7	30			
Axes				
	50	3	-	7
Crowbars				
	30	3	-	5
Knives				
3/4	18			
1/2	18			
1/4	12	3	-	7
Manna	18			
Kura Knife	6			
Scrapes				
	80	1	-	4
Table Knives				
	75			
Small knives	100	1	-	5

The above figures show that the time and labour requirements in the production of tools like large knives, axes, crowbars, etc.. are much higher than what is required for the production of simple tools like scrapes, table knives, and small knives.

3.5 Production Economics:

In terms of raw materials used, a significant variation cannot be seen between the districts, but the prices and type of raw materials vary from place to place. For example, the blacksmiths in Weboda sometimes use discarded mamoties to make knives, whereas the blacksmiths in Kotmale (Mawatura) use motor springs for the same. Similarly, the price of 1 kg of hard steel in Matara is Rs.12.00, but the blacksmiths in Kegalle (Epalawa) have pay Rs.15.00 for it. The payments made for hired labour also vary from area to area. In Kothmale (Mawatura), a skilled labourer is paid Rs.75.00 per day with meals, but in Matara (Parawahera) the rate of payment for a skilled labourer is Rs.100.00 per day with meals.

In view of this situation, it is difficult to make a general cost-benefit analysis which can be applied to every blacksmithing community. Therefore, three separate calculations of production economics are made for Kothmale, Epalawa and Parawahera.

Kothmale (Mawatura)

(1) Item:

Knives		Costs	% from total
No. 3 Knife		(Rs.)	Costs
Raw materials	Quantity		
Hard Steel	500g	5.00	8.0
Charcoal	1 1/2 Kg.	18.00	28.7
Coconut Oil	-	6.10	9.7
Wooden Handle	-	1.60	2.6
Nails	-	.68	1.1
Total Material Cost		31.38	50.1
Labour		25.00	39.9
Depreciation		6.10	9.7
Overheads		.15	0.3
Total Production Costs		62.63	100.0
Sale Price per Knife		70.00	-
Profit Margin		7.37	

(2) Item:

Axe		Costs Rs.	% from total Costs
Raw material	Quantity		
Mild Steel	4 Kg	32.00	38.0
Charcoal	2 Kg	24.00	28.5
Total material costs		56.00	66.5
Labour		27.00	32.0
Depreciation		1.10	1.3
Overheads		.20	0.2
Total Production costs		84.30	100.0
Sale Price Per Axe		110.00	-
Profit margin		25.70	-