PERFORMANCE ANALYSIS OF KAMCO GARDEN TILLER AMONG ITS USERS IN KERALA

By

ARYA S B (2015-31-016)

MAJOR PROJECT REPORT

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COLLEGE OF CO-OPERATION BANKING AND MANAGEMENT

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KERALA, INDIA

2017

DECLARATION

DECLARATION

I, hereby declare that this project entitled **"PERFORMANCE ANALYSIS OF KAMCO GARDEN TILLER AMONG ITS USERS IN KERALA"** is a bonafide record of research work done by me during the course of project work and that it has not previously formed the basis for the award to me for any degree/diploma, associate ship, fellowship or other similar title of any other University or Society.

Vellanikkara
16-10-2017

ARYA S B (2015-31-016)

CERTIFICATE

CERTIFICATE

This is to certify that the major project report entitled **"PERFORMANCE ANALYSIS OF KAMCO GARDEN TILLER AMONG ITS USERS IN KERALA"** is a bonafide record of project work done by Miss. Arya S B under my guidance and supervision and she has successfully completed the project, in line with the objective set for the same.

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Place:Vellanikara

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This is to certify that the below mentioned student has done her Project in the Marketing Department of this corporation during the period from 31.07.2017 to 03.10.2017.

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For any errors or inadequacies that may remain in this work, of course, responsibilities entirely mine.

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DESIGN OF THE STUDY

1.1 Introduction

Agriculture is the most important sector of Indian economy. Indian agriculture sector accounts for 18 per cent of India's gross domestic product (GDP) and provides employment to 50% of the countries workforce. The country's agricultural production has stagnated at a time when the broader elements of the economy have grown. Though India has achieved self-sufficiency in food grain production, the last couple of decades have seen the growth rate of food grain production (1.5 per cent) lag behind that of population (1.9 per cent). While efforts such as introduction of high yielding varieties and expansion of irrigated area have played a crucial role in achieving the goal of food self-sufficiency in the past, rapidly growing demand for food has brought the need for building efficiencies in agriculture to the forefront. Towards this objective, it is imperative to focus on improving the intensity of farm mechanization in the country. It facilitates timely, precise and scientific farm operations, increasing farm input and labor use efficiency. This would result in significant improvement of agricultural productivity.

Some key advantages of farm mechanization are, it increases the crop intensity and yield thus ensuring better returns to the farmer, reduction of weather risk and risk of non-availability of labour. It also minimizes post-harvest wastages, improves working conditions and enhance safety for the farmer. It aids in the conversion of uncultivable land to agricultural land through advanced tilling technologies, shifting land used for feed and fodder cultivation for draught animals towards food grain production etc. The use of improved farm implements and machinery also increases efficiency of costly inputs such as fertilizers, chemicals and seeds; and maximizes profitability.

Though, India leads in agricultural production, in terms of farm mechanisation, it is behind the world average. Highly diverse farm size & soil types which warrant the need for customized farm machinery and equipment for different regions of the country has been

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a serious impediment for Agro machinery industry in India and the mechanization of Indian fields helps in effectiveness and utilization of inputs to increase the productivity of land and labour. Besides it helps in reducing the drudgery farm operations.

The manufacture of agricultural machinery in India is quite complex comprising of village artisans, small scale industries, State Agro Industries Development Corporations and organized tractor, engine and processing equipment industries. These industries have adopted sophisticated production technology and some of them match international standards. Since cost of production of farm machinery in India is more competitive due to low labour wages, the importers from various countries will find Indian farm equipment more attractive. The end objective of farm mechanization is to enhance the overall productivity and production with the lowest cost of production. State Agro Industries Corporations were set up to manufacture, demonstrate and promote agricultural implements and establish agro-processing plants in different states.

Kerala Agro Machinery Corporation is a well renowned company in Kerala which helps in establishing mechanization in the field of agriculture all over India. It is found that use of tiller in Kerala is less compared to other states in India due to various reasons. Fragmented small and marginal land holding make garden tillers a preferred choice of farmers in Kerala. Kitchen gardening and small scale cultivations are increasing now. So there is a trend of purchasing garden tiller more in these days. Garden Tillers are ideally suited for mechanizing small farm holdings which account for 80 per cent of the farm holding of the country. Garden Tillers have several advantages such as comparatively light weight, adjustable tilling width, Italian technology, completely Indian made etc. KAMCO is a Public Sector Undertaking in marketing the garden tillers in India. It is highly suitable for cultivating vegetables, flowering plants and prepare land for sugar cane coconut tree etc. Considering the applications of garden tiller there is a scope for promoting the sale of garden tiller.

1.1.1 Transforming agriculture through mechanization

Indian agriculture has marked its presence at the global level. India ranks among the top countries in the world that lead in production of a number of crops including rice, wheat, sugarcane, fruits and vegetables. The two major problems challenged Indian agriculture are low per hectare productivity and shortage of agriculture labour. There is ample evidence which suggests that productivity improves dramatically with usage of more farm power. It has been further estimated that use of proper equipment can increase the productivity by up to 30 percent and reduce the cost by about 20 percent. However, India, with a mechanization level between 40-45 percent lags in comparison to other countries such as China and Brazil. Agricultural machinery market in India is estimated to grow at a CAGR (Compound Annual Growth Rate) of over 10 percent during the period 2013-18.

While opportunities in Indian farm machinery sector are immense, the sector faces challenges on several fronts. Unlike other agricultural sectors, farm mechanization sector has a far more complex structural composition. It has been observed that the sector's performance depends on the interplay of factors, that include, financial aspects such as capital and the rate of interest, lack of data, small and scattered land holdings etc. Innovations in farm machinery sector have the potential to drive the next phase of agricultural growth in the country. The Government of India has been encouraging mechanization through different policy interventions. The technologies that have evolved in the farm machinery sector in last few years have enormous potential to realise the vision of 'Make in India' initiative which promotes innovation and investment.

1.1.2 Major challenges:

The major challenges in farm mechanization faced by India includes the following:

i. **Small and scattered land holdings**: Average farm size in India is less than 2 hectares, which is far lower than developed regions which are highly mechanised. Larger farm machineries are difficult to operate on such land holdings and in some cases actually completely unsuitable. Another factor to consider is that mechanising small and non-contiguous group of small farms is against economies of scale.

ii. **Equipment cost and poor after-sale service**: Farm equipment is capital intensive, making it a major investment for small and marginal farmers. Quality of after-sale service is another concern due to inadequacy of proper maintenance in remote regions of rural areas.

iii. **Tractorization and not mechanisation** – Tractor penetration has increased from one per 150 hectares to one per 30 hectares. However, such an increase in penetration has not been seen in other segments of farm equipment.

iv. **Financing of farm equipment** – Unwillingness of commercial banks to finance farm equipment is one of the biggest impediments to the increase in mechanisation level in India. The interest rates that farmers face are also very high and need to be addressed.

1.1.3 Production cycle and Mechanization

Production cycle of agricultural products includes all the steps involved from preparation of soil to harvesting and post-harvest processing. For every step in the production lifecycle, use of equipment enhances the efficiency of the unit involved. Farm mechanisation not just reduces labour time and post-harvest loss but also helps to cut down production cost in the long term. Popular machines for different phases of agriculture production are entered below.

a. Seed bed preparation- Tractors, Leveller, Ploughs, Dozers
b. Sowing and planting- Drill, Seeder, Planter, Dibbler
c. Weeding, inter cultivation, plant protection- Harrow, Tiller, Sprayer, Duster
d. Harvesting and threshing- Harvester, Thresher, Digger, Reaper
e. Post-harvest and agro processing- Seed extractor, Dehusker, Huller/ Dehuller, Cleaner, Grader.

1.1.4 Benefits of farm mechanization:

Farm mechanisation has been known to provide a number of economic and social benefits to farmers. Primary among the economic benefits is the improved yield that comes

as a result of greater level of mechanisation. The following benefits of farm mechanisation makes it a crucial component of shaping the future of Indian agriculture.

i. **Input savings**: Studies have shown a direct relationship between farm mechanisation (farm power availability) and farm yield. Farm mechanisation is said to provide a number of input savings like seeds (approximately 15-20 percent), fertilizers (approximately 15-20 percent), increased cropping intensity (approximately 5-20 percent) etc.

ii. **Increase in efficiency**: Farm machinery also helps in increasing the efficiency of farm labour and reducing drudgery and workloads. It is estimated that farm mechanisation can help reduce time by approximately 15-20 percent. Mechanization also helps in improving the harvest and reducing the post-harvest losses and improving the quality of cultivation. These benefits and the savings in inputs help in the reduction of production costs and allow farmers to earn more income.

iii. **Social benefits**:

   a. Helps in conversion of uncultivable land to agricultural land through advanced tilling techniques and also in shifting land used for feed and fodder cultivation by draught animals towards food production.
   b. Decrease in workload on women as a direct consequence of the improved efficiency of labour.
   c. Improvement in the safety of farm practices.
   d. Helps in encouraging the youth to join farming and attract more people to work and live in rural areas.

1.1.5 Mechanization in agriculture - Indian scenario

In Indian agriculture history, it was mostly a matter of human sweat and draft animal labour. From soil preparation to reaping the harvest, it required backbreaking manual labour. Early people who can be called as 'first engineers' developed tools to ease farming burdens. Still, even in late 19th century, farming and hard labour remained virtually

synonymous, and productivity had not shifted much across the centuries. At the end of the 19th century it took, for example, 35 to 40 hours of planting and harvesting labour to produce 100 bushels of corn. A hundred years later producing the same amount of corn took only 2 hours and 45 minutes. And fewer workers were needed on farms. The high yielding varieties with assured irrigation and higher rate of application of fertilizers gave higher returns that enable farmer to adopt mechanization of inputs, especially after the green revolution in 1960s.

At the turn of 20th century the introduction of internal combustion engine set a dramatic change and leads to the invention of tractor which drove agricultural mechanization. When viewed across the span of 20th century, the effect that mechanization has had on farm productivity-and on society itself is profound. The early agricultural mechanization in India was influenced by technological development in England. Tractors and threshers were gradually introduced for farm mechanization. The present trend in agriculture mechanization is for high capacity machines through custom hiring and for contractual field operations.

The role of farm mechanization has now gone beyond tractorization with which more emphasis on increasing productivity of land and labor and increasing work output per unit time. Efficient machinery is being introduced in the country for crops that entails high manpower requirement such as cotton, sugarcane etc. supported by favorable policy, testing facilities and infrastructure. This indicates that transformation has begun in the country and usage of farm machinery is expected to accelerate over the years providing customized solutions to different crops, land holdings and varied agro climates.

The agriculture sector in India has witnessed a considerable decline in the use of animal and human power in agriculture related activities. The trend has paved a way for a range of agricultural tools. A large number of these are driven by fossil fuel operated vehicles such as tractors, diesel engines. This has resulted in a shift from the traditional agriculture process to a more mechanized process. Though the level of mechanization in India is lower as compared to other developed countries, it is certainly on growing. The role of tractors in the Indian agriculture sector reflects the growing trend of tractorization

in the country. Custom hiring of farm equipment is a prevalent practice in India, especially among small land owners who find ownership of large farm machines expensive and uneconomical. The government is therefore promoting farm mechanization by subsidizing purchase of equipment as well as supporting bulk buying through front-end agencies. The government also provides credit and financial assistance to support local manufacturing of farm mechanization equipment. Given the labour scarcity and the government's subsidy programs, adoption of farm mechanization is set to increase. Indigenously developed agricultural hand tools and implements have also evolved over time and despite the strides agricultural machinery has made, continue to play a critical role in agriculture. This is on account of the small and irregular farm sizes, lack of machinery available for smaller land holdings, lack of awareness and skills among farmers and inability of farmers to afford more advanced technologies. Hand tools have also been developed for all levels of the value chain. In 2010, when the size of the agricultural labour force was 269.74 million, the estimated number of hand tools in use was 809.22 million, which equates to about 3 hand tools per labour. However, the prevalence of these tools comes with the issue of safety. An ICAR study (2004-2007) showed that 34.2 percent of accidents in agriculture were due to hand tools, with sickles and spades involved in 46 percent of farm injuries. Implications of injuries due to hand tools are severe as these injuries are very painful and disabling due to delayed treatment. A survey conducted in India showed that 70 percent of agricultural hand tools injuries had a recovery time of more than seven days. Thus, developing farm machinery more suited to the local conditions is essential so that injuries and problems that come with the use of hand tools can be abated while making agricultural practices more productive. It has been estimated that use of proper equipment can increase the productivity by up to 30% and reduction of costs at about 20 percent.

Innovation in farm machinery sector will thus drive the next phase of agricultural growth in the country. The Government of India has been encouraging mechanization through different policy interventions. A dedicated Sub-Mission on Agricultural Mechanization has been initiated in the Twelfth Plan, with focus on spreading farm mechanization to small and marginal farmers and regions having low farm power availability. As a result, Indian farmers is fast adapting farm mechanization than ever before. The agriculture equipment market in India is presently valued at 6.5 billion USD

and has enormous potential for further growth. Join efforts made by the government and farm equipment industry in the country have led to such progress in mechanization over the years.

1.1.6 Farm mechanization- Kerala scenario

The State is the first in the country in human development index, literacy rate and sex ratio. In recent years, the State is going ahead in ecotourism and information technology also. However, the predominantly agro based rural economy drags back the State economy. The state's agriculture sector contributes only 10.88% (2013-14) of total GDP. Poor return and high labor cost has forced many of the growers to keep away from agriculture.

The extend use of farm machineries in production of crops are far behind compared to other states in India. Paddy and ginger are the major crops utilizing machineries in farming compared to other crops. The main problem in Kerala is the shortage of labor, high cost of cultivation and lack of interest in farming. In order to tackle such problems, mechanization has been adopted by both state and central governments. Agro Industries Corporation in the State is the main agency for development and supply of farm machineries for the State need.

Mechanization in Kerala was constrained due to the lack of appropriate machinery systems suited for varying field situations of the state even though commercial brands of machines proven elsewhere are available in the market. The youth have been progressively alienating themselves from the hazards and drudgery of farm operations. Farm operations can be sustained only by attracting younger generations to the farms by introducing appropriate mechanical practices that would reduce drudgery, improve timeliness of operations and provide attractive wages to farm workers.

90 per cent central assistance scheme is intended for procurement of farm machineries, propagation of mechanization in agriculture and to improve the infrastructure facilities in padasekharams, research and development on farm machineries, conduct of training programmes on use of machineries, etc.

1.2 Background of the study

It is in this backdrop, the present study was envisaged on Garden Tillers, one of the effective machines suited to small and marginal farmers and highly fragmented areas. The study aimed at analyzing the perceived performance of KAMCO Garden Tiller among its users in Kerala and identify various constraints faced by them in using the product. This will help the Kerala Agro Machinery Corporation Ltd. to improve their marketing efficiency. So far no attempt has been made to study the customized needs of farm mechanization for small and marginal farmers.

1.3 Statement of problem

Small and marginal farmers predominates agricultural sector of Kerala and land in Kerala is highly fragmented. So there is a trend of preferring garden tillers rather than power tillers. KAMCO has introduced Garden tiller and has been in the market for the past 6 years. It will be advantageous to analyse the performance of Garden Tiller by study the factors which attracts customers to purchase KAMCO Garden Tiller and constraints faced by them in using it. The results will enable KAMCO to reorient the product and revise marketing strategies to suit the customer needs, which will helps to improve sales of garden tiller.

1.4 Objectives of the study

The main objectives of this study are as follows

1) To identify the factors that influenced the purchase of KAMCO Garden Tiller by its users.
2) To identify the constraints faced by customers in using KAMCO Garden Tiller
3) To analyze the perceived performance of KAMCO Garden Tiller
4) To suggest recommendations for improving the marketing of KAMCO Garden Tiller

1.5 Methodology

1.5.1 Period of study

The study was conducted during the year 2016-2017.

1.5.2 Design of study

An ex-post facto research design was adopted for the study.

1.5.3 Sample size and method of sampling

An exhaustive list of KAMCO Garden Tiller customers from KAMCO was used in the study. Random sampling was used to select 50 customers from the list for the study.

1.5.4 Data collection

Both primary data and secondary data were collected for the study

Primary data:

Primary data were collected from selected customers through telephonic interview method using structured interview schedule.

Secondary data:

Secondary data was collected from company records, websites, books, published reports, brochures etc.

1.5.5 Data collection tool

Structured interview schedule prepared for the purpose was used.

1.5.6 Observations made

i. Criteria for the purchase of KAMCO garden tiller.
ii. Special features of the product that highly preferred by the customers.
iii. Constraints faced by customers in using KAMCO Garden Tiller, which includes

a. Geographic constraints
b. Technological constraints
c. Maintenance constraints
d. Marketing constraints
e. Economic constraints
f. Informational constraints

iv. Performance analysis of KAMCO Garden Tiller.

a. Fuel efficiency of the machine
b. Labour saving
c. Increase in yield
d. New crops introduced
e. Utilization of household labour
f. Change in drudgery
g. Change in leisure time
h. Interest in farming
i. Change in health status
j. Discrepancy between promised and delivered product by KAMCO
k. Willingness to recommend the product to others

1.5.7 Data analysis tools and methods

a. The data was analysed by using Statistical Package for Social Science (SPSS) and Microsoft Excel those are most widely used statistical soft wares.

b. Collected data was converted into tables, charts and graphs to ensure easy understanding of the analysis.

c. Statistical tools like Percentage analysis, Index method, Garrett's ranking method etc. were used for analysing collected data.

Garrett's Ranking Technique: This technique was used to rank the preference indicated by the respondents on different factors. As per this method, respondents were asked to assign the rank for all the factors and the

outcomes of such ranking was converted into score value with the help of the following formula:

Percentile position = 100(Rij-0.5) / Nj

Where

Rij = Rank given for the ith variable by the jth respondent

Nj = Number of variable ranked by jth respondent

With the help of Garrett's Table, the percent position estimated was converted into scores and mean values of score is calculated. The factors having highest mean value is considered to be the most important factor.

1.6 Scope of the study

a) Analyze the performance of KAMCO garden tiller.
b) Helps the company to know what are the constraints felt by the customers about the usage of their product and can take decisions according to that.
c) Company can formulate strategies to overcome the constraints and to expand the marketing of garden tiller.
d) Help the government to formulate policies regarding subsidies and incentives.
e) Helps KAMCO to facilitate profit maximisation through increasing the sale of garden tiller.
f) To help the customers by availing the best product from KAMCO.
g) Enhance mechanization and leads to growth in national agricultural income.

1.7 Presentation of the project report

The chapter wise distribution of the project will be as following

Chapter 1 Design of the study

Chapter 2 Review of literature

Chapter 3 Company Profile

Chapter 4 Analysis and Interpretation

Chapter 5 Summary and conclusion

Bibliography

Chapter II

REVIEW OF LITERATURE

One of the most important preliminary stages of a research project is conducting review of literature. A thorough scanning of literature related studies in the past helps the researchers to find whether any study had conducted that supports the researcher's topic. And it also help to find the gap and make our study more relevant.

Keeping in view of the fact, review of literature relevant to the objectives of the present study is presented under the following headings:

2.1 Impact of farm mechanization

Gill (1983) made a comparative analysis of animal and mechanical farm power. He reported that power tillers cultivated land more thoroughly and these practices lead to higher yields. Tillers could cultivate heavy, dry, or otherwise difficult soils. Facilitate early planting and complete the job faster and thus permit timelier planting which in turn lead to increased annual yields for individual crop.

Singh (1989) described that increasing commercialization of agriculture, mechanization is very important. There has been increased in the use of farm machinery in Indian Agriculture as it contributed to the increase in output due to timeliness of operations and increasing precision in input application.

Singh and Singh (1990) studied energy inputs in agriculture in selected countries namely India, Thailand and Nepal. They developed the yield and farm mechanization ratio (MR) for quantifying the degree of mechanization and found that the average crop yields increased with the mechanization ratio with the different categories of farms.

Singh (2001) concluded that cropping intensity was mainly dependent on annual water availability and the farm power available. He reported that the States like Punjab, Haryana,

and Uttar Pradesh which had higher percent irrigated area, higher doses of fertilizer and higher power availability per hectare also had higher grain yield per hectare.

Vatsa (2006)The draft of National Policy of Agricultural Mechanization prepared by the Central Council for Agricultural Mechanization set-up by the Ministry of Agriculture in 1998, observed that with the emphasis on timeliness, precision and general improvement in the quality of work, farm mechanization has resulted in the increase in cropping intensity, yield and employment. Very little emphasis has yet been laid to modernize the farm particularly with improved farm tools and equipment for augmenting the crop production in the hilly state of Himachal Pradesh. The modern techniques of crop production have not only created an impact on increasing productivity but also on reducing drudgery involved in farming operations, which directly or indirectly attract the farming community.

Ramaswamy (2008) described the importance of farm mechanization in dry lands such as use of power weeder, mini tiller, ferti-seed drills, low till rotovators, combine harvesters that are used for maize and pulses in rain fed regions.

Troy (2013) made a comparative study on garden tiller and garden cultivator. He reported that garden tillers are used to prepare a garden for spring by turning and loosening the soil before the season starts. They are also useful in the fall for adding nutrients back into the soil when the growing season is over. Garden tillers are usually larger than garden cultivators and can dig deeper into the ground due to their large, durable tines.

Gabriel (2014) described agricultural mechanization as the process whereby equipment, machineries and implements are utilized to boost agricultural and food production. It reduces drudgery which makes it difficult for large scale food production and which has also been making it difficult for Nigeria to meet the food requirement for increasing population.

John Deere (2016) stated that farm mechanization provides various economic and social benefits to farmers like significant improvement in crop yield. It also helps in increasing the efficiency of agricultural labor and reducing labor and workloads. It also aids in improving the harvest and reducing post-harvest losses. Such benefits help the farmers to

reduce production costs and earn extra income. With the predicted water scarcity in the future, along with the increasing need to ensure food security in the country, the benefits of farm mechanization will be a vital component in shaping the future of the Indian agriculture sector.

2.2 Marketing of farm machineries

Kotler and Armstrong (1989) defined marketing as a social and managerial process by which individuals and group obtain what they need and want through creative and exchanging products and value with others.

Rijk (1991) suggested that the establishment of 'farm machinery service centers' under the leadership of farm laborers with financial support from government or co-operative institutions, so that the farmers in the region could avail the facility. In the process, additional employment would also be generated.

Kumar (2003) revealed that majority of consumers were highly enlightened and concerned with the quality of products. He also revealed that the consumers uniformly both in rural and urban areas desired to have the quality product at reasonable prices and trust more in the advice of retailers.

Vikas (2003) in his study explained that brands were successful because the people prefer them to ordinary products. In addition to the psychological factors brand gives consumers the means whereby they can make choice and judgments. Customers could then relay on chosen brand to guarantee standard quality and services.

Quayum (2003) opinioned that there were many advantages of tiller over bullock power for land preparation. Draught animal power requires 147 hours and a power tiller requires only 22 hours for tilling one hectare of land saving 125 hours in Bangladesh.

Usha and Gireesh (2006) opinioned in their study that the objective of modern marketing was to make profit through satisfying customer needs and wants. Hence the marketers had

to understand the real needs, wants, relieves and attitudes of the customer towards products and services.

Anand and Mehta (2007) in their study on forecasting the trends of agricultural equipment, and supplies industry, they found that, a large agricultural sector in a given region or country does not translate necessarily into a vast market for farm machinery. This is especially true in developing countries where human (manual) and draft-animal farming techniques have prevailed for centuries. In fact, of the world's five largest countries in terms of agricultural output, four are below average in terms of equipment usage: Brazil, Russia, India, and China (BRIC). Of these, India has the furthest to go, with about 60 percent of its labor force still engaged in agriculture while only 20 percent of its gross domestic product is derived from that sector. In these four countries, numerous subsistence-type farming units prevail whose limited income prevents purchase of even lower-end mechanized products. But there is a growing corporate farming sector, and several domestic machinery manufacturers are making inroads. India's Mahindra & Mahindra is leading the way; it is currently the world's fourth largest tractor producer.

Andrew and Gross (2007) made an analysis on global market for agriculture machinery and equipment. They reported that while the agricultural sector is significant in most countries, backward farming methods and shortage of capital pose major problems for producers attempting to sell machinery. The region as a whole relies heavily on imports of agricultural equipment. Israel and Saudi Arabia have production facilities, with Netafim (Israel) an important maker of irrigation products. Upgrading the quality of farm machinery stock in the region will be a slow process in most markets.

2.3 Factors affecting the use of farm machineries

According to the report of Project Planning and Monitoring Cell of the Government of Kerala (1986), the small size of farm holdings constituted a large segment of arable land in Kerala and small farmers had little access to appropriate farm equipment's, especially power tiller.

Gupta and Ram (1989) suggested that machines in farming were possible only through Government support to co-operative groups of farmers to make them economically viable and to enable farmers to meet local requirements. As the farming scenario in Kerala was highly sensitive due to the presence and operation of militant trade unions, it is essential to formulate a package for adopting mechanization after conducting a thorough investigation.

According to Khan (1991), efforts to mechanize agriculture in many developing countries have been directed towards introducing a variety of imported farm machines. This import-based technology transfer strategy has not been successful to small farm holdings. One reason could be the inappropriateness of the technology to local farming conditions as most of these machines were developed in countries with large farm holdings.

Nikkade (2000) opinioned that youth were progressively alienating themselves from the hazards and drudgery of farm operations. Agriculture could be sustained only by attracting younger generations to the farms by introducing appropriate mechanical practices that would reduce drudgery, improve timeliness of operations and provide attractive wages to farm workers.

Bautista (2003) stated that decreasing supply of hired labour in the farm is decreasing owing to preference of labor to employment opportunities in the urban centers and abroad and high level of education and literacy in the labor force. In rice production, labor costs represents around 60% of the total input costs in rice production. Farmers therefore have to mechanize in order to lessen costs and dependence to the unreliable supply of hired labor in the countryside while increasing crop productivity at the optimum.

Bautista (2003) opinioned that the lack of support services to ensure machine's acceptability to farmers has been a continuing constraint in promoting agricultural machineries. These include limited access to credit, and ineffective marketing systems.

According to Saraswat (2003) conducting timely operations under rain-fed conditions is very difficult. On the other hand, topography is restricting the introduction of large mechanical power like tractor in most of the region. That means climate and topography are factors affecting farm mechanization.

According to Paras (2005), extension workers are the key persons in technology transfer. They need not only interpersonal communication skills, but technical qualifications as well. With a very limited number of extension staff for a big number of client-farmers, the result would likely end-up in non-adoption of some technologies. Besides, these workers might be lacking the capability to integrate the mechanization technology in the total farming system. They too, might be lacking in trainings particularly dealing with agricultural mechanization.

Shambhu and Ram (2007) conducted research at Nalanda district of Bihar state and found out farm mechanization status. In the study stated that different limitations being observed by farmers in the mode of adoption of most of agricultural implements were because of their small size farm land holdings. Lack of knowledge and trainings in agricultural engineering extension programmes, non-availability of equipment comes under required crops, scattered field, electricity non-availability; lack of farm field road, economic status can be poor, lack of genuine spare parts and service credit availability in research area.

Biggs and Justice (2011) said that agriculture was facing a shortage of labor as a result of outmigration of youths in search of employment opportunities. This was also partly due to the lack of attention in reducing drudgery in agricultural and rural operations for poorer farmers and laborers. This labor shortage had a distinct influence on the mechanization of agriculture. Which had accelerated in the last two decades.

Pillai (2011) stated that mechanization in Kerala was constrained due to the lack of appropriate machinery systems suited for varying field situations of the state even though commercial brands of machines proven elsewhere are available in the market. The youth have been progressively alienating themselves from the hazards and drudgery of farm

operations. Farm operations can be sustained only by attracting younger generations to the farms by introducing appropriate mechanical practices that would reduce drudgery, improve timeliness of operations and provide attractive wages to farm workers.

Mehta (2014) reported that the widely fragmented and scattered land holdings in many parts of the country need to be consolidated to give access for their owners to the benefits of agricultural mechanization. And he suggested that the small farms can be mechanized by use of improved manual tools and animal drawn farm equipment on individual ownership basis or high capacity farm machinery on custom hiring basis. Medium and large scale farmers may be provided with Govt. subsidies to encourage them to buy and to apply advanced medium and high capacity machinery such as cotton picker, rice transplanter, and sugarcane harvester and combine harvester on their fields.

William Edwards (2015) studied the various reasons for replacing farm machineries. It includes cost minimization, reliability, pride of ownership, new technology and need for capacity.

Tanvi Deshpande (2017) revealed that some challenges faced by farm mechanization include different soil and climatic zones which require customized farm machinery, and small land holdings with lack of access to resources. Mechanization should aim to increase agricultural efficiency by reducing the time and labour requirement, minimizing wastage and reducing costs of labour.

2.4 Performance analysis of farm machinery

Sogaard and Sorensen (1996) mentioned that agricultural machinery management is the part of farm management that deals with the optimization of equipment phases of agricultural production. It is concerned with the efficient selection, operation, repair and maintenance, and replacement of machinery.

Edwards (2001) opinioned that the performance of a farm machine often depends on the skill of the operator or on weather and soil conditions.

Serrano Joao et al., (2005) stated that one of the main indexes of energy consumption in tillage operation is overall energy efficiency of farm machinery. The overall energy efficiency transferred energy from the implement launch, per energy equivalent of fuel consumption in different operations. The overall energy efficiency indicated the general condition of machine's performance.

Hassan, Omran (2011) in a study conducted to predicting performance of agricultural machinery states that, Agricultural Machinery performance program that predicts field efficiency, field capacity, selection of optimum equipment, draft power required to operate machines and PTO power was developed to meet the user requirements for machinery management and as educational and research tool.

Azoodar and Mohammed Ali (2015) in their case study on Reliability analysis of agricultural machineries reveals that the performance of agricultural machines depends on the reliability of the machinery used, the operating environment, the maintenance efficiency, the operating process, the technical expertise of the farmers and etc. As the size and complexity of farm equipment continue to increase, the implications of equipment failure become over more critical.

Abbas and Omer (2011) opinioned that participating in a wide range of operations, from initial operations of soil cultivation to harvesting, agricultural machinery may represent from 40 to 50 percent of the total production cost. Therefore, the right choices of equipment coupled with its rational use are extremely important decision-making factors in farm management.

2.5 Parameters for purchasing farm machinery

Selection of power –equipment is associated with farm size, soil condition, cropping pattern, cultural practices, yield, purchase price of machines etc.

Bector and Singh (1999) concluded in their study that in the field machinery selection, the most pertinent variable is size or capacity of the machine. Although annual cost of operation of implement, purchase price of the implement, area under the implement, speed of implement, effective width of implement, field efficiency of implement, repair and maintenance cost, labour charges, fuel cost, operating cost etc. are also influential factors on farm machinery selection.

Oksanen and Visala (2007) studied the path planning algorithms for agricultural machines particularly for irregular plots. According to them, appropriate selection of power-equipment system is extremely important for determining the net returns in agriculture for a given farming situation, which not only enhances the annual machine use but also limits the operational costs and energy consumption. Thus, there is an ardent need to develop criteria of selecting the power units like power tiller and equipment for timely completion of agricultural operations at the minimum cost and reduced drudgery for hilly regions.

Alam et al., (2001) opinioned that mostly the farmers depend on their own experience or recommendation by other farmers or machinery dealers for purchasing agricultural equipment because a large number of variables and complex interactions are required during the proper selection procedure.

Chapter III

COMPANY PROFILE

3.1 Introduction

The need for modernization and mechanization has ignited revolutionary changes in the country. Realizing the opportunities and need for indigenously made farming equipment for Indian farmers, Government of Kerala took the historical decision to set up "Kerala Agro Machinery Corporation", popularly known as KAMCO in the year 1973, as a wholly owned Govt. of Kerala undertaking. The objective of the company is to manufacture in India, either in collaboration with or otherwise or import and trade agricultural machineries to provide Indian farmers with farming equipments. KAMCO is always committed to bringing latest international technologies available in the world over and customizing the same to suit Indian farming conditions, thus ensuring the most sought-after farming equipment to farmers in India.

Engineering Green Revolution is the Mantra of KAMCO. The heart of India lies in the villages and the lifeline of our village is its agriculture. Hence by making millions of Indian farmers do mechanized farming KAMCO ensures peak agricultural productivity. The objective also include establishment of engineering workshop, repair shops to undertake repair and servicing of agricultural machinery or other machinery, equipment, implements and tools.

Assembly unit was established I 1970 at Athani by Kerala Agro Industries Corporation for the assembly of KUBOTA Power Tillers in technical collaboration with KUBOTA Ltd. Japan, the world's leading manufacturer of Tiller and other agricultural machinery. On the expiry of collaboration KAMCO manufactured Power tillers with their own facilities. KAMCO manufacturing facilities include special purpose machines and imported machines. The inspection facilities include modern inspection and testing

equipment, KAMCO have their own methodology, calibration and engine testing lab. On pursuit for making farmers reap bounty has made the company work relentlessly towards excellence. In 1996 in recognition of the work culture of KAMCO, they were accredited with most coveted ISO 9002 system certification which was subsequently upgraded to ISO 9001:2000 for their manufacturing facilities. Now they are maintaining quality system as per ISO 9001:2008, certified by Intertek, UK. Efforts are in place for 9001:2015 quality system accreditations under 9001:2015.

KAMCO is engaged in manufacturing agricultural machines mainly intended for small and marginal farmers in the country established in 1973; the company has now completed 44 years of services. Company has got for manufacturing units now in Athani, Kalamassery, Mala, Kanjikode and Valiyavelicham. Athani unit is also the registered Office of the company. With over 600 staff members, 69 sales and after sales service centers and a visionary management supported by Govt. of Kerala, our sales turnover touched yet another milestone of over 2000 million INR in 2014. With the present work force KAMCO produces over 10000 Power tillers and 10500 reapers per annum.

The company is working profitably for the past 20 years. The company was incorporated with the intention of manufacturing and marketing agricultural machines useful for farmers. Company has 9-12 HP kerosene, petrol and diesel products. Athani, Palakkad and Kalamassery units manufactures Power tillers and Mala unit manufactures Power tillers and Power reapers. From Power tiller to 4 wheel Tractor, KAMCO has made history in the areas of producing small agricultural machinery to give a boost to the engineering green revolution in India. Currently KAMCO product range includes Super DI Power Tiller, Power Tiller KMB 200, Power Reaper 120M/120H/120DS, KAMCO Tera TRAC 4W Tractor, Garden Tiller/Power Weeder, Brush Cutter KBC 300 and Water Pumps. The machines have acquired a reputation for quality, providing products at reasonable price to the satisfaction of the customers. Company enjoys all India sales through networks of about 76 dedicated dealers. Products are sold at premium prices. KAMCO is also exporting products to certain countries.

Garden Tiller is an equipment suitable for small farm holding for basic weeding, ridging tilling and inter cultivation. Tiller breaks the soil into fine parts which is highly

suited for horticulture. It is developed using advanced Italian technology which perfectly suit Indian conditions. The company plans to diversify its activities further in acquiring technical knowhow and going into regular manufacturers, under license of machines suitable for other agricultural purposes with small and marginal farmers in mind. Set out as a single unit- single product manufacturing company, KAMCO now stands as a multi-unit multi-product company with state- of-the-art production facilities at five different locations in God's Own Country.

3.2 Vision:

KAMCO salutes the millions of farmers who have made our country greener and richer. Since more than half of the population is involved in cultivation activities, agriculture becomes the backbone of Indian economy. So, KAMCO has a vision to set agriculture as one of the prime areas for modernization and mechanization, thus making India self-sufficient in the domains of agricultural produce through farm mechanization.

3.3 Mission:

a. Sourcing latest technologies available the world over, customizing the same to match national needs.

b. Committed to follow quality systems and state-of-the-art production facilities at work.

c. To be innovative, resourceful and profitable company.

d. To meet customers' requirements of quality, service, and price consistently.

e. To provide a congenial and entrepreneurial work environment in which employees can respond to the needs of business and service earn fair reward and can be satisfied.

3.4 Activities of the company

KAMCO manufacturing facilities include special purpose machines, specially built general machines and imported machines. The inspection facilities include modern inspection and existing equipment. KAMCO have their own metrology, calibration and engine test lab. The following are the main activities of the company.

Manufacturing and marketing of agricultural machines like power tillers, tractors, power reapers, garden tiller, water pump and brush cutter. Major components for power tiller are manufactured at Athani and all other component bought out from dedicated vendors in India. There are around 250 vendors are now. Kalamassery unit produce engine for power tiller. Power reaper is produced at Mala. The company is manufacturing and trading other farm machineries also.

3.5 Organisation goals

KAMCO with 3 over decades of engineering excellence, stands as the number one power tiller manufactures in India. Not surprising, with four state of the art products, an innovation R and D and stringer quality control systems rated as one of the best in the country. The technically, dedicated management and workforce will go on to ensure that KAMCO shall be leader for several years to come.

a) To be an innovative, resourceful and profitable company

b) To meet customer requirements of quality, service and price consistently

c) To make "doing business with us easy" and delightful to our customers

d) To provide a congenial work environment in which employees can respond to the needs of business and service earn fair reward and can be satisfied

3.6 Product Range

KAMCO's product range includes Super DI Power Tiller, Power Tiller KMB 200, Power Reaper 120M/120H/120DS, KAMCO TeraTRAC 4W Tractor, Garden Tiller/Power Weeder (B30, K40), Brush Cutter KBC 300 and Portable Pump Set KWP (30M, 40S). Each of these products are time tested and have proven their worth many times over their owners.

3.6.1 KAMCO SUPER DI POWER TILLER (12 HP)/ KAMCO POWER TILLER KMB200 (9 HP)

Power tiller can be considered as a complete farming unit which is powerful, versatile and fuel saving tiller. It can deal with farming operations like tilling, ploughing, puddling, weeding, pumping, leveling, spraying, ridging, hulling, transportation etc single handedly. It has been designed to function equally well in both wet and dry soil condition. It has retained its market position as the number 1 power tiller in India for the last 4 decades, after marketing its debut in 1973.

KAMCO Power Tiller has a compact engine with unique radiator cooling system for the most demanding jobs, and with a lower weight-per output rating. The engine is perfected for low smoke level to satisfy Emission norms conforming to even TREM-III norms. It has other specialties like simple movements and controls for easy handling, perfectly balanced and vibration-free engine to reduce operator fatigue, have fail-safe safety devices to prevent accidents, automatic fuel control etc. Fittings like Cultivator, Ridger, Plough, Water Pump, Riding Seat, Potato Digger, Sprayer, Leveller, Trailer etc can be attached with it.

KAMCO SUPER DI POWER TILLER

3.6.2 KAMCO TeraTRAC 4W Tractor

KAMCO Tractor can be used for puddling, inter cultivation, weeding, transportation and other farming operations. It has compact Italian design engine with power steering and ergonomic seating with arm rest. It has a diesel engine with 15.4 HP (PTO Power 13.4). Rotovator, Cultivator, Ridger, Bed former, Flail mower, Lawn mower, Post hole digger, Sprayer, Trailer etc can be attached with it.

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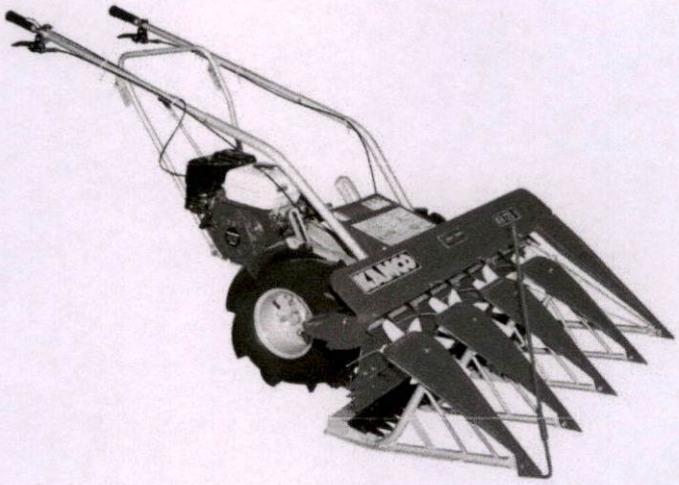
3.6.3 KAMCO POWER REAPER KR120

It is a powerful product suitable for harvesting crops like rice, wheat, maize, corn, soya bean, fodder etc. It helps to reap a hectare of land within 3-4 hours. It can do the work of 20 farmers with sickle. It can prevent loss of grains while reaping for about 75%. Harvest rate of KAMCO Power Reaper is 0.7 acre per hour. Another specialty of the product is that, it is light enough to be carried by two persons. Its smooth chain conveyor action delivers plants gently and makes clean windrows. Cutting height above ground can be adjusted from 5-25 cm with simple adjustment of wheels.



3.6.4 KAMCO GARDEN TILLER/POWER WEEDER (B30-3.89 HP/ K40-4.64 HP)

The all new easy-to-handle Garden Tiller is developed using advanced Italian technology. The tiller is fitted with powerful petrol engine with reduced noise, vibration and emission. It needs minimum investment, low operation and maintenance cost. And it provides maximum efficiency also. All these make KAMCO Garden Tiller the most economical choice of farmers. Major applications of Garden tiller are weeding, tilling,

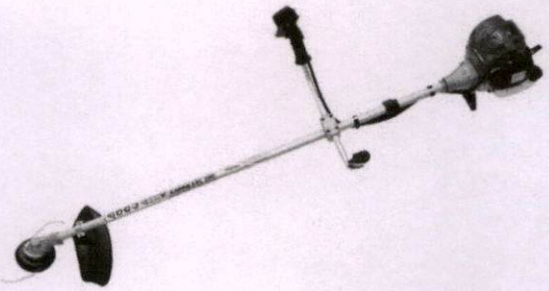
furrowing, soil preparation for vegetable cultivation and in orchards and sugar fields, and spade work in coconut groves.

The machine is designed with complete safety features and hence it can be used conveniently by both men and women. The machine can be dismantled easily and transported across any terrain. The rear wheels can be easily lowered for easy movement. Furrower can be attached with it.

KAMCO GARDEN TILLER B30

3.6.5 KAMCO BRUSH CUTTER KBC300

It is one of the fast moving products of KAMCO. It is reliable and having durable design. It is easy to start and quiet operation lightest engines in their class. It has an excellent balance and low vibration. So it is comfortable to use over long periods of time.



3.6.6 KAMCO PORTABLE PUMPSET (KWP 30M/ KWP 40S)

It is a more water carriage pump set having less maintenance and fuel consumption. It is easy to start and portable. It has less vibration and less running cost.

3.7 Departments in KAMCO

In **KAMCO** there are 11 Departments. They are as follows:-

1. Marketing Department
2. Finance Department
3. Human Resource Department
4. Materials Department
5. Purchase Department
6. Stores Department
7. Quality Assurance Department
8. Production Department
9. Maintenance Department
10. Research Development Department
11. System Department

3.7.1 Marketing Department

Survival of any company depends upon marketing strategies adopted. This is particularly important in the competitive era. Surviving from a lot of difficulties KAMCO became no: 1 brand in the agricultural machinery market. Due to globalization KAMCO products have to compete with the international product. The product from China is the major treat for the company because of its low price. But KAMCO is not ready to compromise with the quality of its products for reducing price. The marketing strategy wins the target. Considering the Indian market now there is only one competitor that now there is only one competitor that is VST tillers and tractors, Bangalore.

Even facing all these competitions companies marketing department plays a better role for getting good result. The strength of marketing department is 25. Head of the marketing is the responsible to ensure that all the individuals in the marketing department follow all the marketing procedures. Entire marketing departments are functioning as a team. Main duties of the marketing departments are presales and after sales services and

these are looked upon by everyone in the department. So everyone is aware of that happens in the marketing section. In the absence of one person other can looking to the problem.

3.7.1.1 Major Activities

Head of the marketing department on receipt of any order or enquiry passes it to concern offers for further verification. All the orders including credit sales and entered into the computer as order booking.

1. All details such as purchase order no: date, model, quality ordered, delivery schedule, payments terms are verified.

2. In case delivery schedule cannot be met as per the requirements of order it is brought to the notice of the head of the department.

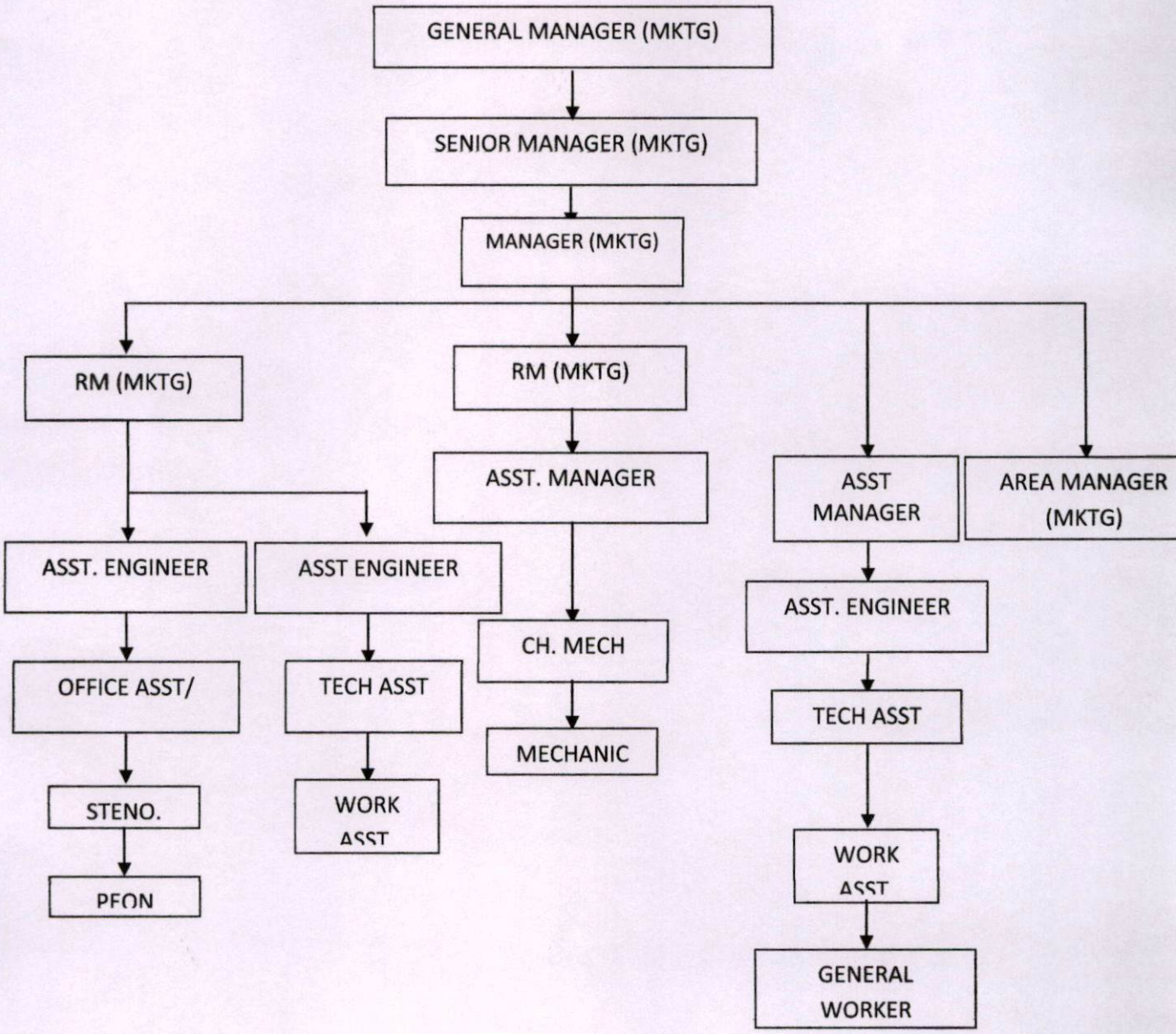
3. Schedule amendments if any are inform to the dealer or customer

4. The divisional head carries out one month wise order position review.

5. When no: of pending orders exceed available stock or production number tiller allotment register is updated and maintained.

6. Records of tiller transfer notes maintained by stores are available in the computer and the
department generates dispatch advice.

3.7.1.2 Structure of Marketing Department



Survival of any company depends upon marketing strategies adopted. This is done by the Marketing department. They ensure that there is a proper flow of goods and services from the company to the consumers. This is particularly important in the competitive era. Surviving from a lot of difficulties KAMCO became a renowned brand in the agricultural machinery market. Due to globalization KAMCO products have to compete with the international products. The product from China is the major threat for the company because of its low price. But KAMCO is not ready to compromise with the quality of its products for reducing price. The marketing strategy wins the target. Considering the Indian market that now there is only one competitor that is VST Tillers and Tractors, Bangalore. Even facing all these competitions companies marketing department plays a better role for getting good result.

The marketing strategy followed by the department.

i. Fixation of target for each dealer.
ii. Have regular contact with the dealers of each state.

Steps followed in the marketing department

a. Agreement is made between dealers and KAMCO and then target is fixed by KAMCO for the purpose of sales as well as spares.
b. Order is placed by the dealers along with DD or by the bank.
c. The marketing department sends the dispatch advice to Athani or Palghat.
d. Then the goods are dispatched by the stores department survival of any company depends upon the marketing strategy adopted.

3.7.1.3 Marketing Strategies

The company has 76 dealers all over India

i. New Dealers appointed to cover selected districts in Guwahati, Assam, Madhya Pradesh etc.

ii. As the part of digital marketing, e-auction is now successfully establishing which makes the processes more transparent and easy.

iii. Close interaction with the Govt. of India in the formulation of new schemes & policies for farm mechanization.

iv. Exhibitions are being conducted in various parts of India with a view to familiarizing the products of KAMCO to the common people.

v. Regular demonstrations and service camps are being organized in various states.

vi. KAMCO Power Reaper has been exported to Haiti, Iran and Sri Lanka recently. These Machines has been well accepted by the customers.

The products of KAMCO are sold through the dealers and direct sales. So the marketing has a direct relationship with the dealers, the products are sold throughout the country through the agro industries corporation and other private dealers of that particular state. The state to which the products sold are Kerala, Tamil Nadu, Karnataka, Maharashtra, Gujarat, Rajasthan, Chhattisgarh, Orissa, Bihar, West Bengal, Assam, Meghalaya, Manipur, Tripura, Uttar Pradesh etc.

3.7.2 Finance Department

Financial performance of an organization is very important factor for the long term survival profitability of any organization. Finance is defined as the provision of money at the time when it is required. Every enterprise whether big, medium, or small needs finance to carry on its operations to achieve its targets. It is livelihood of an enterprise. Without adequate finance no enterprise can possibly accomplish its objective. This department controls the overall financial transactions of the company. It controls the receipts and payments of each and every activity for all the divisions. In KAMCO, finance department plays a major role because in public sector only very few companies and earning profit

KAMCO is a multi-storeyed multiunit organization. It means KAMCO have more than one unit established with their own fund. Surprising thing is that KAMCO is giving dividend and carrying profit for 22 years. The department keeps a record of everything concerning any expenses or income.

3.7.2.1 The Important functions are follows

a) Budget and Budgetary control

Annual budget are prepared for both capital and revenue, based on the requirements furnished by various units and departments. The departmental requisitions are analysed and after consultation with the departmental heads and corporate divisional management group and it are finalized bases on the disposition of funds. Consolidated budgets are presented to management or board for approval. Budgetary control of the company is exercised by the costing department of various departments. The budget is reviewed half yearly and revised if found required based on the deviations of actual from budget. Such changes are submitted to management or board through a revised budget for approval. This revision is intimated to concerned department for implementation.

b) Management of Receipts

A payment from dealers or customers reviewed through marketing department is acknowledged by issuing proper receipts. Customer wise or dealer wise accounting is adopted. Debits outstand department are informed to marketing department once in a month for further actions. Insurance, freight out ward, bank negotiations etc are accounted and maintained to revise the cost of sales, daily sales proceeds in the sales counter and other receipts are verified and accounted. Half yearly reconciliation of payments and receipts with dealer is prepared by accounts department and settled with dealer.

c) Management of Payments

Subject to the availability of funds, payment commitments are honoured on due dates. All the payments are passed mainly on the basis of IGRR. Advance payments are settled within a time of 45 days. Non-receipts or delayed receipts extra are brought to the notice of stress for remedial actions. Payments are usually done by cheque or DD.

d) Auditing

Internal audit is mainly based on corporate functioning. Internal audit mainly takes care for the 'CARO' requirements of company's act. 'Watch Dog' for an entire organization. The main function of this department is to ensure that policy decisions of the management is strictly followed by the functional departments and is verified by the internal audit.

e) Costing

Costing records are maintained as per the cost accounting rules. They are mainly subjected to cost audit ordered by company law board. Costing department also advices management and departments, which are the potential areas of cost reduction. Mainly costing departments analyzes cost of productions on a yearly basis. Costing department advices accounts departments the cost of rejection as per warranty claims

f) Statutory Transactions

Sales tax, Income tax etc are issued and properly accounted and timely settlements are made. Salary and other payments, recoveries and their remittance etc in the case of employees are done in time.

g) Management Information System

1. Revenue and Expenditure
2. Salary period and disbursement

3. Non-financial schemes
4. Allowances given
5. Cash Management
6. Pay roll
7. Capital Structure

3.7.3 Human Resource Department

Human recourse department deals with all the functions related to the human recourses in an organization.

a) Identify human recourses requirements, job specifications, skill needs.

b) Evaluate and select suitable personnel.

c) Maintain the competence of personnel through HRD method.

d) A personnel record sheet is prepared of very personnel.

e) New appointments are put on orientation training for one or two weeks duration

f) Service training is given to permanent employees.

g) Department head will assess the training needs and forward it to HRD unit head. HRD committee will examine the training requirement forwarded to the HRD head. HRD committee will prepare training calendar. At the end of the year HRD department will submit details of the training arranged to the MD and MR.

h) On receiving training each employees of unit is required to submit the training.

i) Report to HRD.

j) Heads of the units prepare an evaluation sheet every six months and is send to the HRD head.

k) HRD or personnel and administration maintain personnel record sheet periodically assesses by the HRD committee assess employee competence.

l) Evaluation of new employees after evaluation training is initiated by HRD.

3.7.3.1 Record Maintained in HRD

1. Personnel record sheet
2. Oriented training report
3. Training report
4. Evaluation sheet
5. Report to MR

3.7.4 Materials Department

It deals with the Purchase of materials, which include purchase planning and selection of vendors.

3.7.4.1 Functions

1. **Purchase planning**

   a) In purchase planning first of all, based on production target annual budget is prepared. After this, worksheet is prepared.

   b) Based on the worksheet, purchase proposal is made. f purchase proposal is for more than 1lakhs, signature of managing director should be made on it. If it is more than 75000, purchase committee should be signed on it. The purchase and DGM finance. If the amount is more than 35000 the signature of senior manager is there.

2. Selection of Vendors

For the suppliers approaching for registration, following will be applicable

a. The registration Form is issued to the supplier for filling up the details

b. These details are preceded and approved, to proceed further by Vendor development committee.

c. Technical personnel designated by HOD assess premises of the supplier.

d. The personnel who visit the premises fill up the vendor evaluation repor

e. After taking decision on the capability of the vendor based on vendor evaluation report they requested to supply samples for approval.

f. Then the samples are submitted to the Quality Assurance department at head office and based on their recommendations regarding samples, decision is taken on ordering on them. They are registered as vendors by the purchase or materials

department at head office, as vendors by the purchase or materials department at head office.

g. The first purchase order is released on trial basis for small quantity. After satisfactory supply of trial order, they are included in the approved vendor list and regular purchase order is released depending on requirement of materials.

h. The head of materials department approves the vendor list.

3.7.5 Purchase Department

All other function other than the purchase planning and vendor selection is done by the purchase department. After approving the vendor list by the materials department, the purchase department then issues a purchase order containing department, the purchase department then issues a purchase order containing details like material quality, rate payment terms, supply schedule etc.

For the purchase of other materials or office equipments, each department has to submit a purchase intend. The board of directors approves the purchase budget for each department at the beginning of the year. All purchase has to be limited to the budget and are subject to approved by finance department. Based on the requirement, an enquiry is made Quotations are obtained from all suppliers and a comparative statement is prepared. Once a supplier has been chosen, the purchase details are sent for intending and financial commitment is made for purchase of budgetary control.

3.7.5.1 Other functions performed by Purchase Department.

1. Ensuring that all raw materials, semi-finished, fully finished components is procured from approved vendors.
2. Ensuring that the procurement action is taken in time by processing repeat orders or tender enquires whenever applicable.

3. Assessing vendor capability to effect supplies in accordance with purchase order meeting acceptable quality and delivers so that they can be listed as approved vendors.

4. Ensuring that the goods received are of consistent quality conforming to the standards or specifications of the purchase order

5. Providing feedback to the vendors for improving quality of supplies and materials.

6. Ensuring that the vendor's performance is recorded monitored and suitably graded.

7. If the inventory goes up beyond the permitted value, purchase department takes appropriate actions to bring down the inventory.

8. Purchase department should take appropriate actions in order to maintain the minimum stock level.

3.7.6 Stores Department

The materials that received from the vendors are stored in the stores department.19 employees working under this department. When the materials have been received by the goods clerk according to the purchase order. It is passed on the store, along with the goods inspection report. The store is a service department, headed by the general, who receives the materials and issues them. They duty of the staff members is not on by the receipt and issue of materials but also many other functions to be compiled with as his position is that not of managerial level.

3.7.6.1 Important Functions

1. Store materials for the company
2. Receipt and accounting of materials including stationary

3. Product delivery
4. Spare parts dispatch
5. Issue of product in FIFO

3.7.6.2 Documents kept by stores department

1. Inspection and goods received report
2. Inter location stock transfer receipt stock issue or transfer note.
3. Stock return note
4. Inter location stock transfer issue
5. Stock issue cum delivery note
6. Bin card
7. Master record index for department quality manual amendments
8. Material presentation Tag
9. Material gate pass
10. Delivery note
11. Report to MRM or Management Review meeting
12. Stock issue or transfer request
13. Stick return request
14. Packing Slip

3.7.6.3 Division of stores

1. Receiving Store
2. Stores for accepted parts or materials after inspection

3.7.7 Quality Assurance Department

Quality assurance Department inspects the quality of materials or parts, which was received from the vendors. Quality management is becomes a key variables in the strategic business policy of the organization at present. Quality management is an important area which will require maximum attention of top management. The attitudes of quality such as

performance, features, conference, reliability, should be constantly evaluated and upgraded so as to cope with the current and future market demands.

Quality assurance clarifies the components into two critical component and non-critical components. Critical components are crank shaft, all engine parts, gear wheels etc. Non critical components are nuts, bolts and screws etc. The clarification is mainly for ignoring the practical difficulty in checking non critical components and only sample inspection in non critical components. Practical difficulty in checking the non-critical component is the problem there from here the production department as their requirements takes the components. After getting a finished product from the assembly department for the final checking. If getting a finished product from the assembly department for the final checking. If it is Ok it is gone to the store. From these the machine will enter into marker through dealers

a) Calibration cell: - Quality assurance Department is equipped with all modal facilities the company has calibration cell to check and correct the measurements of all measuring instruments.

1. Ensure the quality of line procedures.
2. Purchased products quality is assessed by quality assurance department.
3. Assembly line inspection done at each work centre.
4. Final inspection of the finished products is done.
5. Calibration is done by the Quality Assurance.
6. A standard committee consisting of the following officers will meet in the beginning of the year upon approval of the budget and as end when required to assess the metrology or measuring or testing equipment,

1. DGM (QA) - CONVENER
2. Department Head (QA) - MEMBER
3. Department Head - MEMBER
4. Department Head (Engineering) – MEMBER

3.7.8 Production Department

Production Department is also known as works department. It is divided into Assembly shop, Machine shop, and a small sub unit for painting which is a sub unit of assembly shop. Annual production is based on the budget this production figure is broken down into monthly targets. Assembly of power tiller is done in separate assembly line viz, engine line, transmission line, tiller line. Parts required for assemblies are got through stock issue notes. Parts required for assembly at each work centre is located in bines at appropriate work section with indication standard parts required by different work centers are kept in centralized places. Painted parts are obtained from the painting section.

1. Assembly is carried out as per process chart.

2. Work carried out in each work centers is recorded. In an assembly line record each assembly line where chassis or engine number of each assembly is noted.

3. After completion of each assembly line concerned machine verifies the assembly and sign the assembly tags with date.

4. At the end of each assembly chief mechanic of that line clears the assembly for the next assembly line.

5. Assembly rejections are removed from the work centre.

6. Tillers are offered for inspection to QA department along with tiller completion report.

7. Engine after inspection are handed back with finished tiller inspection report.

3.7.8.1 Division of sections

1. Assembling
2. Pre-treatment and Painting
3. Machine Shop

3.7.8.2 Functions:-

1) Assembly Shop

Assembly is one of the major section in production department. The finished components are taken from the stores and it is sent to assembly as required. The engine assembly is one of the main work in the assembly. After testing the assembled engines, it is sent to the painting section. Through different transmission in the assembly we get the finished products. In the power tiller here using two types of engines (Diesel engines and DI engines)

2) Painting Booth

In KAMCO they are using a good advanced booth. After cleaning the components it will go for painting through a conveyer belt and after painting it will go over through the belt. Mainly they are using two colour for painting one is Ash and other is Post office red.

3) Machine Shop

Company has a machine shop which is producing 15 components. These are critical components. Company have a modern machine shop with special purpose machines which ensures conformity with prescribed quality standards. The materials purchased by the purchase department, then sent to the stores from there, the materials to the QA department, it sent to the Machine shop. In the machine shop the process like milling, drilling, boring etc. are doing on material to get the product which is used in the assembly. From the machine shop the finished products are directly sent to the assembly only for the inspection in QA. From the QA it will be sent to the stores.

3.7.9 Maintenance Department

Maintenance Department deals with the maintenance of machine tools and equipment used for production.

3.7.9.1 Types of Maintenance followed in KAMCO

Mainly there are 4 types of Maintenance Management:-

1. Preventive Maintenance
2. Breakdown Maintenance
3. General Maintenance
4. Spare parts management

Spares and consumables required are procured as and when required. Review of spare parts and consumables is carried out once in a year. Shift arrangements are done by HOD of maintenance. In Preventive maintenance, schedule is prepared by head of the department and is given to concerned department and electrical or mechanical maintenance section. Electrician or mechanic under the supervision of change hand takes up the machines for preventive maintenance.

All the machines and equipment are attended once in every month, defects notices if any rectified. Head of the department carries out final checks. After carrying out preventive maintenance work the preventive maintenance checklist are filled up by the electrician or mechanic and counter signed by charge hand or chief mechanic department head reviews the reports every month. Monthly report is given to divisional head. Maintenance schedules are reviewed every 6 months by divisional head.

In Breakdown Maintenance, maintenance or repair order is made by the concerned department indicating the location of nature of faults and signed by the reporting officer. Maintenance order is received by the section head and handed over to the concerned charge hand for execution. After completion of the work the operation is demonstrated and the

mechanic hand over the equipment to the concern department. Repair completion report is given to the concerned department.

1. Maintenance work is also done through outside agencies and the transactions are recorded.
2. Machine breakdown data is analysed using Pareto's principle.
3. Spare parts maintenance is done once in a year
4. Areas covered by the maintenance department are electrical, substation, telephone system, water supply system, welding operations and general maintenance.
5. Shift arrangements of the work are done by the HRD maintenance.

The maintenance motto of maintenance department is to minimize the down time and make available all the machinery promptly. The main responsibility of electrical section is uninterrupted power supply and total preventive maintenance

3.7.10 Research and Development Department

KAMCO has a very intelligent research and development team. The R and D activities of the company are now being attached to the engineering departments. Government of India had stipulated certain norms to meet the minimum performance standard for the power tiller in view of the complaints of farmers on the performance of power tillers especially after the introduction of Chinese tillers. According all the power tiller manufactures have been advised to company with the minimum performance standards to consider subsidy for the power tiller at the end of the final year. The modifications are implemented by delivering safety cover with in the record time and the tiller got tested and approved by central farm testing and training institute, Budni during May-July 2001, Government of India had cleared training institute, Budni during May-July 2001, Government of India had cleared KAMCO power tiller meeting minimum standards in July 2001 for eligibility of subsidy.

3.7.10.1 Functions:-

1. Revise drawings for correction or improvement based on feedback from customer, feedback from production, purchase and Quality assurance departments.

2. This covers activities with regard to modifications for improvement to products and consequent changes to the relevant drawings..

3. Keeping all drawings in safe custody, maintain them promptly and issue copies to indenting department

3.7.11 System Department

This is the youngest department in the company. KAMCO is still in the process of developing a system whereby it can make optimum usage of IT recourses. At present KAMCO makes use of a customized ERP package based on ORACLE. The package was developed and is implemented in 2001-2002. The system department does not play a role in production planning. The module incorporated in ERP package used are the Finance Module, Marketing
Module, Purchase processing, and Inventory Module, Human Resource Management and the
Maintenance Module.

3.7.11.1 Finance Module

a. Payroll and incentive administration
b. Material purchases
c. Sales
d. Payables and Receivables
e. Day to Day cash position reporting
f. Individual bank wise balance reporting

3.7.11.2 Marketing Module

a. Order booking
b. Invoicing
c. After sales service

3.7.11.3 Purchase Processing and Inventory module

a. Purchase processing
b. Material requirements
c. Inventory transactions
d. Finished goods evaluation
e. Material rejection

3.7.11.4 Human Resource Management Module

a. Personal history including employee details and service details
b. Payroll processing
c. Training
d. Attendance and incentives including Office time, leave etc

3.7.11.5 Maintenance Module

a. Equipment maintenance
b. Calibration

In KAMCO, the systems in all departments are connected through LAN.

3.8 Dealers

The major dealers in India are

1. Assam
   - ✓ M/s NBK Maa Supply agency
   - ✓ M/s Chemtrade India Pvt. Ltd.
   - ✓ M/s Trinetra Supply Center

2. Bihar
    - ✓ M/s Usha Agro Industries Pvt. Ltd.
    - ✓ M/s Balaji Distributors

3. Chhattisgarh
    - ✓ M/s Reliable Distributors
    - ✓ M/s Jhabak Tractors

4. Gujarat
    - ✓ M/s Jai Ambe Tractors
    - ✓ M/s Navsari Taluka Co-operative Purchase-Sale Union Ltd.

5. Jharkhand
    - ✓ M/s Premier Distributors

6. Karnataka
    - ✓ M/s New Tech Distributors

7. Kerala
    - ✓ M/s Kerala Agro Industries Corpn. Ltd.
    - ✓ M/s Regional Agro-Industrial Development Co-operative of Kerala Ltd.

8. Madhya Pradesh
    - ✓ M/s Reliable Corporation

9. Maharashtra
    - ✓ M/s Dahanu Agro Center
    - ✓ M/s Maharashtra Agro Ind. Dev. Corp. Ltd.
    - ✓ M/s Sanap Engineering

10. Manipur
    - ✓ M/s Jamunalal Mangilal & Co.

11. Nagaland
    - ✓ M/s Pipi Traders

12. Meghalaya
    - ✓ M/s Stanley Roy Construction

13. Orissa
    - ✓ M/s Eastern Enterprises
    - ✓ M/s Orissa Agro Industries Corpn. Ltd

14. Rajasthan
    - ✓ M/s Jain Enterprises

15. Tamil Nadu
    - ✓ M/s Bharati Saravanan Power Tiller Agencies
    - ✓ M/s ASal Agro Motors
    - ✓ T.N Delta Agro Sales and Service Co.

16. Tripura
    - ✓ M/s Tripura Horticulture Corpn. Ltd.
    - ✓ M/s Krishi Shilpa Udyog

17. Uttar Pradesh
    - ✓ M/s Mayfield Tractors

18. West Bengal
    - ✓ M/s West Bengal Agro Industries Corpn. Ltd.
    - ✓ M/s Friends Machinery & Spares

Chapter IV

ANALYSIS AND INTERPRETATION

4.1 Demographic profile of the respondents who purchased KAMCO Garden Tiller

4.2 Factors influenced the purchase of KAMCO Garden Tiller by its users

4.3 Constraints of farmers in the use of KAMCO Garden Tiller

4.4 Analysis of perceived performance of KAMCO Garden Tiller

4.1 Demographic profile of the respondents who purchased KAMCO garden tiller

Demographic profile of respondents include their gender, age, land size and its ownership status, annual income and farming experience. It has a vital role in determining one's accessibility to the common resources and livelihood pattern. In this study it gives more clarity about the customers of KAMCO Garden Tiller.

Table 4.1 Distribution of KAMCO Garden Tiller customers according to their gender

Sl. No:	Gender	Frequencies (%)
1	Male	**43** (86%)
2	Female	**7** (17%)
	Total	**50** (100%)

Gender-wise breakup of the respondents which revealed the overwhelming majority (86 per cent) of them are male. Female constitute only 14 percent of the sample. This indicates that male took upper hand in ownership and use of KAMCO Garden Tiller. As seen generally in Kerala, men are dominating in the agricultural sector in the study area.

Figure 4.1 Distribution of respondents according to their gender

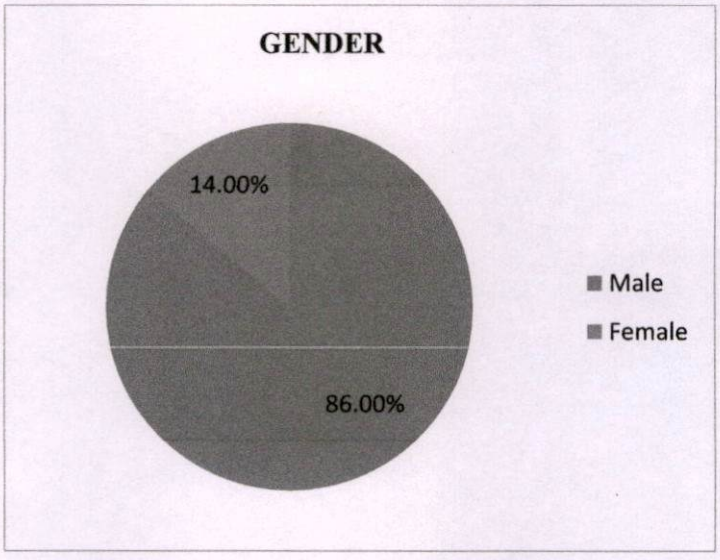


Table 4.2 Distribution of KAMCO Garden Tiller customers according to their age

Sl. No:	Age level	Frequencies (%)
1	30-40	8 (16%)
2	41-50	17 (34%)

71

3	51-60	22 (44%)
4	Above 60	3 (6%)
	Total	50 (100%)

The age of the respondent showed that 44 percentage of the respondents were above 50 years of age which indicated that the young generation was keeping away from agriculture. Respondents whose age ranged between 30 and 40 constituted 16 per cent. Rest 34 per cent were in the age group 41-50. This showed that majority of the respondents belonged to middle and upper middle age and they owned the responsibility of farming. Results also indicated that the product was not much popular among the higher age group of above 60 years.

Figure 4.2 Distribution of respondents according to their age

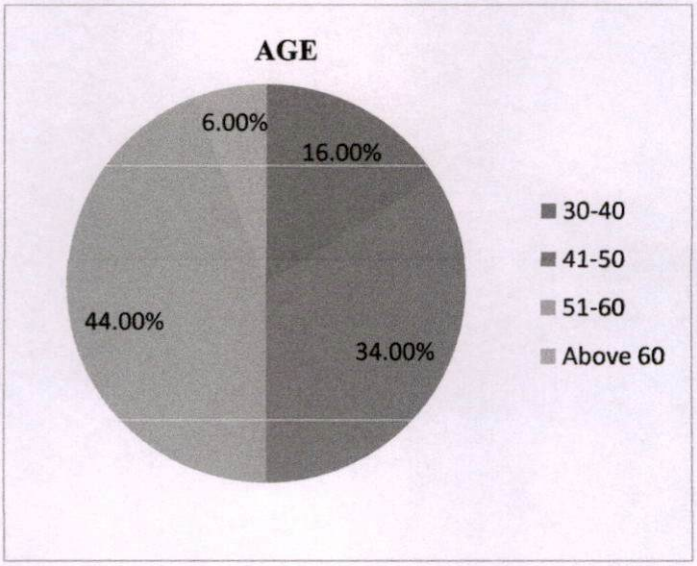


Table 4.3 Distribution of customers according to their occupation

Sl. No	Occupation	Frequencies (%)
1	Agriculture	36 (72%)
2	Employment	8 (16%)
3	Business	6 (12%)
4	Others	0 (0%)
	Total	50 (100%)

The main occupation of majority (72 per cent) of respondents were agriculture. Their major source of income was also agriculture. Others were doing employment (16 per cent) and 12 per cent were doing business as their major occupation. They were also interested in agriculture and purchased KAMCO Garden Tiller.

Figure 4.3 Occupation of respondents

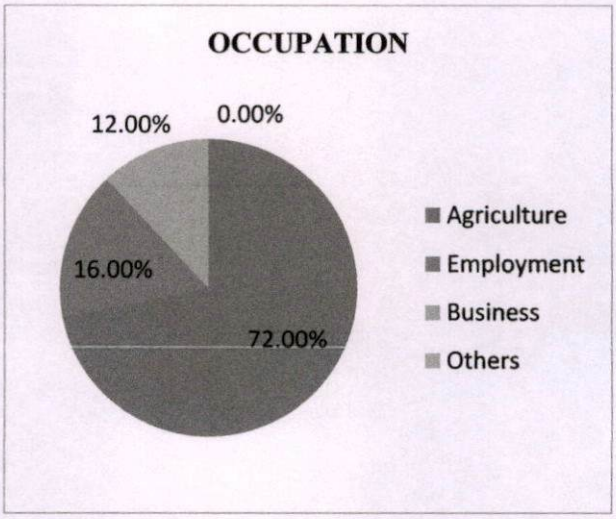


Table 4.4 Distribution of customers according to their land holding size

Sl. No	Land size	Frequency (%)
1	Below 1 acre	32 (64%)
2	1-2 acre	13 (26%)
3	3-5 acre	5 (10%)
4	Above 5 acre	0 (0%)
5	Total	50 (100%)

Majority of the respondents (90 per cent) were having land below 2 acre. Such farmers are more benefited by having garden tiller. Because Garden tiller is designed for small and medium farmers having less land area. People having land above 60 cent can apply for subsidy scheme. Only 10 percent of respondents have land holding above 3 acre. They are not utilizing their full area for cultivation purposes. In sizeable area of land, it is difficult to use Garden tiller. Instead of that, they want to use power tiller, tractor etc.

Figure 4.4 Land holding size of respondents

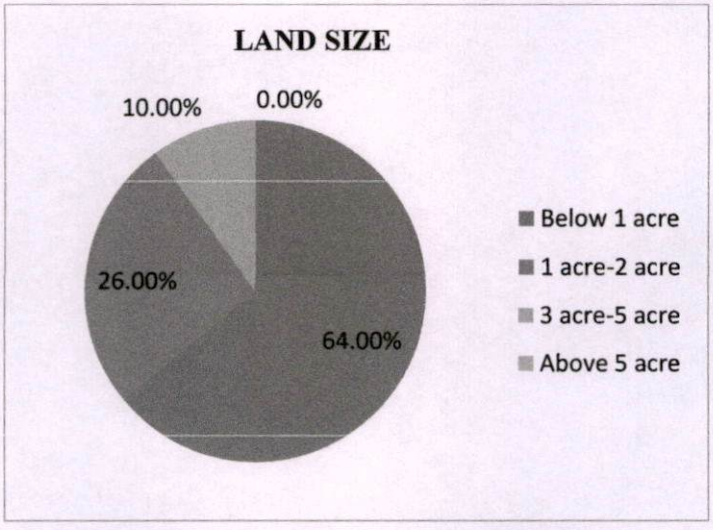


Table 4.5 Distribution of customers according to their ownership status of land

Sl. No	Land holding	Frequency (%)
1	Owned	36 (72%)
2	Leased	14 (28%)
	Total	50 (100%)

Results indicated that land ownership was a critical factor in mechanization. It was found that 72% of the users had own land and only 28% of users had leased land. Leased land users were mostly members of Padasekhara Samithies, Kudumbasree units etc. who took up farming as group basis. This revealed the importance of custom hire centers in popularizing farm machineries.

Figure 4.5 Ownership status of the land holding of respondents

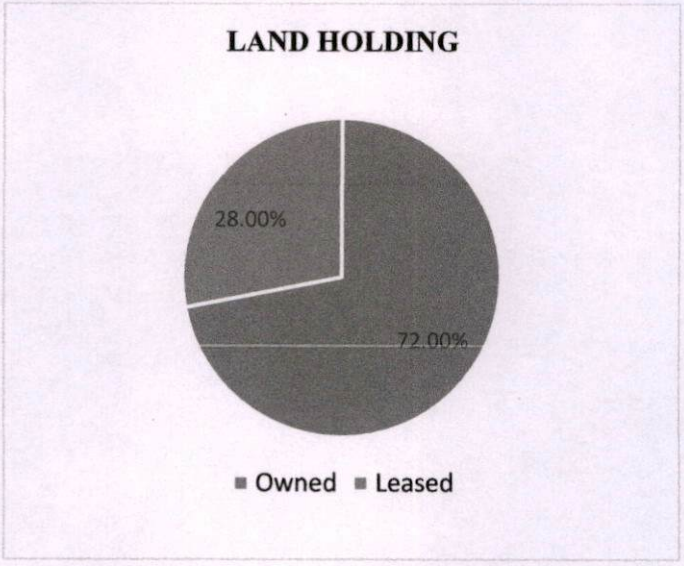


Table 4.6 Distribution of customers according to annual income

Sl. No:	Annual income	Frequency (%)
1	Below 2 lakh	29 (58%)
2	2- 4 lakh	12 (24%)
3	4-6 lakh	7 (14%)

4	Above 6 lakh	2 (4%)
	Total	50 (100%)

It is depicted in the result that more than half of the respondents (58 per cent) are generating an annual income below 2 lakhs. There are 24 percent of respondents who are earning 2-4 lakh per annum and 14 percent having annual family income 4-6 lakhs. Only 4 per cent are generating above 6 lakh rupees per annum.

Figure 4.6 Annual income of respondents

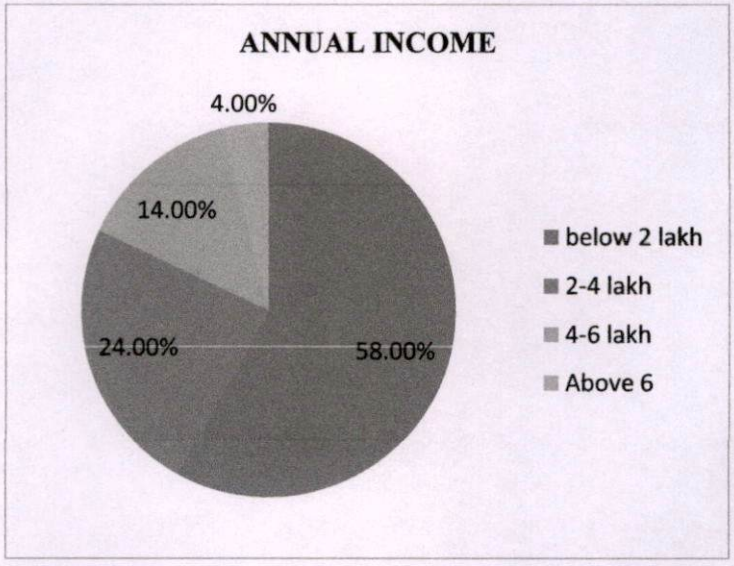


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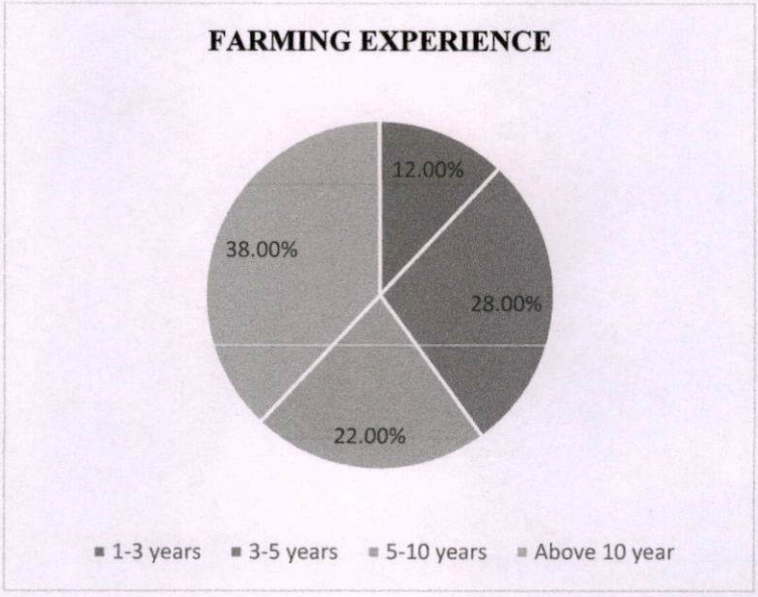
Table 4.7 Distribution of customers according to their farming experience

Sl. No:	Farming Experience	Frequency (%)
1	1-3 years	6 (12%)
2	3-5 years	14 (28%)
3	5-10 years	11 (22%)
4	Above 10 year	19 (38%)
	Total	50 (100%)

Experience in the field of farming is an important factor in the adoption of farm mechanization. Being half of respondents were having age above 50, majority (38 per cent) were having above 10 years of farming experience. 22 percent had 5-10 years of experience in agriculture and 28 percent of respondents have 3-5 years of experience. These indicated that people who were interested in this field also sought more ways to improve their cultivation. That is why they purchased KAMCO Garden Tiller as a part of farm mechanization. 12 percent of people were having 1-3 years of experience in farming. This is a good indicator that even the percentage is less, upcoming farmers also preferring KAMCO garden tiller for their cultivation purposes. Now people are more aware about their health and are preferring kitchen gardening for cultivating toxic free vegetables. Such people are also there who have less farming experience. The results indicated the trend of mechanization is being adopted by new farmers.

Figure 4.7 Farming experience of respondents



4.2 Factors that influenced the purchase of KAMCO Garden Tiller by its users.

Various criteria influenced customers in the purchase of garden tiller. That was divided into two- Market features and Product features.

4.2.1 Market features

It included the quality, brand reputation, after sales service, availability of product etc. And product features included fuel efficiency, convenient in handling, presence of petrol engine etc.

All criteria were ranked by the customers. Some of the criteria were studied in detail for better understanding and analyzing. Every respondent ranked 8 criteria and were analyzed using Garrett's Ranking Technique. This technique was used to rank the preference indicated by the respondents on different factors. As per this method, respondents were asked to assign the rank for all the factors and the outcomes of such ranking was converted into score value with the help of the following formula:

Percentile position = 100(Rij-0.5) / Nj

Where

Rij = Rank given for the ith variable by the jth respondent

Nj = Number of variable ranked by jth respondent

With the help of Garrett's Table, the percent position estimated was converted into scores and mean values of score was calculated. The factors having highest mean value was considered as the important factor. That is shown in the below table.

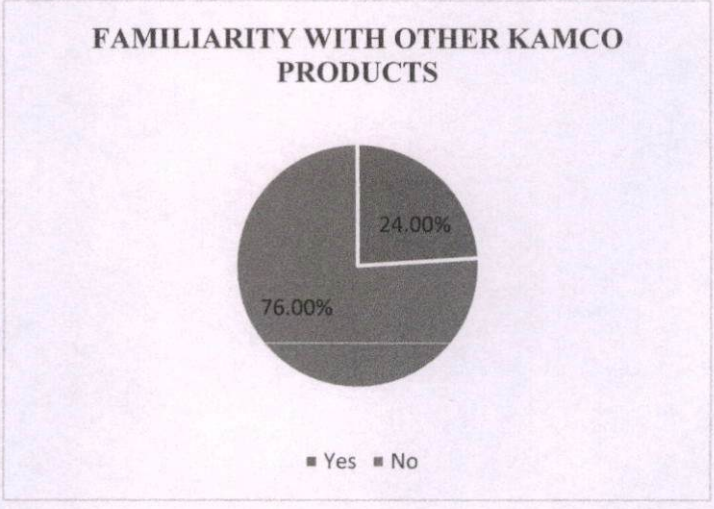
Table 4.8 Market features

Sl. No	Factors	Total	Average Score	Rank
1	Brand reputation	3085	61.7	II
2	Quality	3320	66.4	I
3	Subsidy	2567	51.34	IV
4	After sales service	2712	54.24	III
5	Availability of product	2535	50.7	V
6	Maintenance cost	2526	50.52	VI
7	Reasonable price	2190	43.8	VII
8	Others	1165	23.3	VIII

Customers have some preferences while choosing a particular product. In this competitive world product should have some uniqueness. Then only it can survive in the market. Respondents ranked 8 factors which was given for them. They were quality of the product, its reasonable price, after sales service, brand, subsidies and incentives, maintenance cost and other factor which is not mentioned.

Table 4.8 clearly revealed that customers' first preference was the quality of product. Especially in product like agro machineries there is no compromise in quality. Customers believed that KAMCO like established company will provide most quality products. To state this, customers were given additional question about their familiarity with other products of KAMCO. The result is shown below.

Figure 4.8 Familiarity with other KAMCO products



From the figure 4.8 it was understandable that 24 percent were already familiar with other KAMCO products like brush cutter, power tiller etc. This showed a repeated purchasing behavior related to the quality of products provided by the company.

The second criteria preferred by respondents was the brand- KAMCO. KAMCO is a well reputed company in the agro machinery industry, and have dealings with all the major states in India and even with some foreign countries. People had high expectations about the reputation of the brand. Below figure revealed about customer's expectation about the brand.

Table 4.9 Expectation about the reputation of brand

Expectation	Percentage	Number
Very high	20.00%	10
High	46.00%	23
Average	24.00%	12
Low	6.00%	3
Very low	4.00%	2

Table 4.9 represented that majority respondents (46 per cent) expected high about reputation of the brand. Among 50 customers, 10 percentage expected very high and 24 per cent customers had average expectation about the brand. But comparatively small proportion (4 percent) had low expectation about the brand KAMCO.

Third factor that prioritized by the customers was the after sales service provided by the company. Customer service was assured in each and every procedures. A special team is there to give all technical support to them. If any repairing is needed to machine, service people will go home as soon as possible when they can. Free customer training service is an attractive specialty provided by KAMCO.

Fourth factor was the availability of subsidies by the Government to promote farm mechanization. This was one of the major factor that drove people to purchase the machinery. Because even they want to pay the full amount first to the company, after reducing the tax amount, 20%-50% of subsidy is getting from government later. This is up to various Krishi Bhavans. But there were respondents who does not have subsidy and make their own payment for the product.

Fifth position was the availability of product. Product was mostly available at KAMCO and dealers like KAICO and RAIDCO outlets. So farmers can avail the product from there. But insufficient KAMCO outlets in Kerala make some difficulty and pressurize farmers to travel long distance to purchase the product. This was stated well in the given information about the source of purchase.

Respondents ranked the maintenance cost in the sixth position as a criteria for purchasing garden tiller. This was another reason people preferred while purchase the product from KAMCO.

Seventh position was about the price. Actually the price was somewhat high for many of the customers. But it is economical compared to its utility. It revealed that price is not an attractive criteria for purchasing KAMCO Garden Tiller.

Other reasons like reliability, Italian design etc. made some customers preferred towards KAMCO Garden Tiller. These all criteria were ranked in the last position.

4.2.2 Product features

Garden Tiller is a very useful agro machinery to small and medium farmers. Product specification is a major factor that attracts the customers. The product specification of KAMCO Garden Tiller was ranked using Garrett Ranking Technique. Now for household farming purposes also this product is preferred. By ranking the specifications company can improve the least preferred features.

Table 4.10 Product features of KAMCO Garden Tiller preferred by customers

Sl. No	Factors	Total	Average Score	Rank
1	Safety	3542	70.84	I

2	Fuel efficiency	3063	61.26	II
3	Weightless	2858	57.16	III
4	Petrol Engine	2410	48.2	VI
5	Self- maintenance	2614	52.28	IV
6	Convenient to handle	2532	50.64	V
7	Portable	1854	37.08	VII
8	Others	1227	24.54	VIII

Table 4.10 clearly showed that people ranked safety as the most preferred feature of KAMCO Garden Tiller. While working with machines, it is important to make sure about the safety of the product. Then came the fuel efficiency in the second position. Weightlessness was a main character of KAMCO Garden Tiller. It may weigh around 60 kg. Presence of petrol engine was ranked in 4th position. After one use garden tiller may be started to use after some months. But due to petrol engine starting problem was comparatively very less. It was very much convenient to use by even ladies and children. Portability of the product came in seventh position as a preferred feature according to the ranking by customers.

4.3 Constraints of farmers in the use of KAMCO Garden Tiller

Constraints in the use of KAMCO Garden Tiller were categorized into 6 dimensions viz. geographical, technological, maintenance, marketing, informational and economic constraints. Factors related to each dimensions ranked under each of them. Customers answered that which of those factors were affecting them, slightly affecting them and not even affecting them. Those factors affected by majority can be considered as major constraint.

This was analyzed using Index method. Each statement (not affecting, moderately affecting, highly affecting) were scored 1, 2 and 3 respectively. Based on these scores

index of each factors under every dimension was calculated using the formula given below:

$$\text{Index for the statements} = \frac{\text{Total score obtained for the statement}}{\text{Maximum obtainable score for the statement}} * 100$$

Maximum obtained score for a statement =

Maximum score obtained for the opinion * Total number of respondents

When the individual index was calculated, the next step was to find out the composite index of the parameters. It was calculated by using the formula:

$$\text{Composite Index for each parameter} = \frac{\text{Total score obtained for the parameter}}{\text{Maximum score} * \text{No. of respondents} * \text{No. of statements}} \times 100$$

The effect of constraints was categorized as High, Moderate and Low based on the obtained index. Here, index below 40 was considered as low, score between 40 and 70 was considered as medium and above 70 as high.

4.3.1 Geographic constraints faced by farmers in using KAMCO Garden Tiller

Geographic factors are majorly non-controllable factors. Effect of various geographic factors are studied here to know which of these are becoming constraint to use KAMCO Garden Tiller.

Table 4.11 Geographic constraints faced by farmers in using KAMCO Garden Tiller

Sl No:	Statements	Total Score	Index	Effect of the constraints	Rank
1	Terrain and composition of land	54	36	Low	II
2	Climate change	55	36.6	Low	I
3	Composite Index		24.22		

Table 4.11 reveals that both the factors were not much felt as a constraint to the farmers who were using KAMCO Garden Tiller. Because they have index value below 35. Considering the composite index it understood that geographic constraint is not affecting the use of KAMCO garden tiller.

4.3.2 Technological constraints faced by farmers in using KAMCO Garden Tiller

Technology plays a significant role in machinery industry. Because, people always prefer better technology which make their life easier and comfortable. Here, factors related to the technology and design of KAMCO Garden Tiller is stated. Respondents answered according to their experience.

Table 4.12 Technological constraints faced by farmers in using KAMCO Garden Tiller

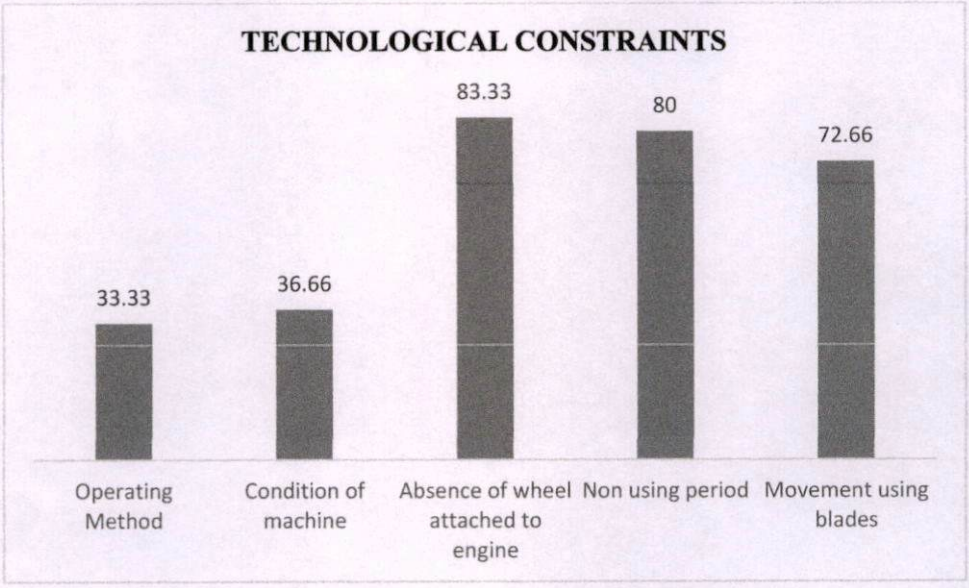
Sl No:	Statements	Total Score	Index	Effect of the constraints	Rank
1	Operating method	50	33.33	Low	V
2	Condition of machine	55	36.66	Low	IV
3	Absence of wheel attached to the engine	125	83.33	High	I
4	Non-using period of machine	120	80	High	II
5	Movement using blades	109	72.66	High	III
	Composite Index		102		

Table 4.12 revealed the constraints related to technology of the machine. It can be observed from the table that, operating method and condition of machine was less affected for the use of garden tiller. Because KAMCO Garden Tiller can be self-operated. Absence of wheel that is attached to the engine, non-using period of the machine and movement using blades are the major constraints faced by the farmers. Garden Tiller does not have wheel attached to its engine. For transportation purpose there are 2 small back wheels that we want to push it for movement. After particular use, the machine may be in unused form for many months. 60 per cent of respondents feel it as a constraint. If the machine was designed for multipurpose it could be used while there was no tilling. Movement of Garden Tiller is possible with the rotation of its blades. Due to that whole weight of the machine carried out by the wheels, make easy breakage of blade. It is also a highly affected factor by the farmers.

4.4.2.1 Ranking the technological constraints

Technological constraints includes either physical design of the machine or internal technological drawbacks of the machine.

Figure 4.9 Technological constraints



While ranking the technological constraints, major constraints faced by users were absence of wheels that is attached to the engine came first position, unused period of machine and movement of machine using only blades.

4.3.3 Maintenance constraints faced by farmers in using KAMCO Garden Tiller

Maintenance constraints include the factors like the maintenance cost, after sales service, need for skilled labour etc. Respondents are revealing which factor is affecting them, not affecting them and slightly affecting them.

Table 4.13 Maintenance constraints faced by farmers in using KAMCO Garden Tiller

Sl No:	Statements	Total Score	Index	Effect of the factors	Rank
1	After sales service	55	36.66	Low	V
2	Maintenance cost	116	77.33	High	II
3	Need of skilled labour for repairing purposes	81	54	Medium	III
4	Unavailability of service package in discount rate	123	82	High	I
5	Availability of spare parts	109	46.66	Medium	IV
	Composite Index		98.8		

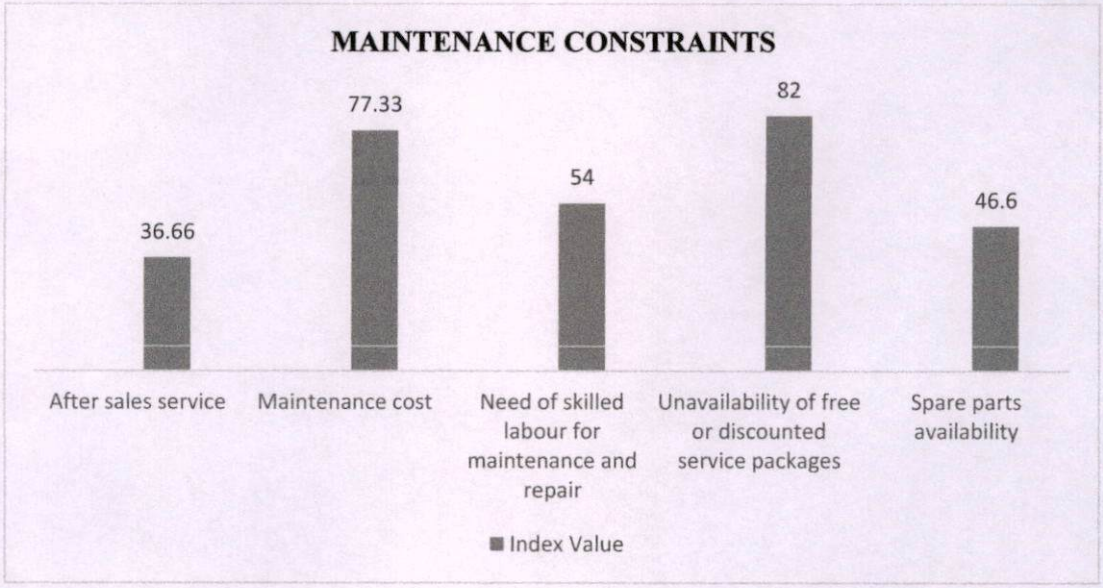
As per the Table 4.13 it is clear that after sale service did not affect majority of respondents. So it cannot be considered as a constraint. According to the users opinion it is observed that maintenance cost was also a factor that highly affected them. The study conducted among 50 respondents revealed that they did not felt immense need of skilled workers for repair and maintenance work. So as per the index score, that factor got medium rank. Because the normal maintenance can be done by themselves. Customers were not getting service packages like set of blades or other spares that are highly breakable, in discount rate. Majority of respondents opinioned that unavailability of service packages highly affect them as a constraint. Spare parts availability had a medium effect on the customers of KAMCO Garden Tiller. Spare parts were available from sales centers of KAMCO and outlets of KAICO and RAIDCO. If needed through courier spares will be

dispatched to the customers from KAMCO. Composite index score also indicated that maintenance constraint was a highly affected one for the users.

4.3.3.1 Ranking the maintenance constraints

Maintenance factors like after sales service, maintenance cost, availability of spare parts, need of skilled labour etc. were ranked according to the degree of constraint felt by each factors.

Fig: 4.10 Maintenance constraints



From the figure 4.10 it is clearly determined that unavailability of service packages in discounted rate is ranked first by the customers. They feel if some packages like providing set of blades in discounted rate for first 1 or 2 years will be more attractive. Another constraint is the maintenance cost occurred by them. And third position is obtained by the availability of spare parts.

4.3.4 Marketing constraints faced by farmers in using KAMCO Garden Tiller

Marketing constraints relating with promotional activities, product features, availability and distribution were studied.

Table 4.14 Marketing constraints faced by farmers in using KAMCO Garden Tiller

Sl No:	Statements	Total Score	Index	Effect of the factors	Rank
1	Promotional activities	90	60	Medium	II
2	Product feature	55	36.6	Low	IV
3	Availability	75	50	Medium	III
4	Distribution	94	62.66	Medium	I
	Composite Index		69.77		

Table 4.14 revealed the marketing constraints faced by the farmers in using KAMCO Garden Tiller. In the matter of promotional activities, customers felt medium constraint. KAMCO always prefer promotional activities like advertisement in agri magazines, conducting exhibitions etc. If promotional activities are extended via Kudumbasree units, residence associations, schools, advertisements in newspaper etc. can help in familiarizing KAMCO Garden Tiller with public to a certain extend. So the product is not that much promoted among general public who are not attending such exhibitions and all.

Product feature affected very less to the customers. Availability of the product created a medium constraint to the customers of KAMCO Garden Tiller. Index score clearly revealed that distribution of the product was also a constraint affected the users of KAMCO Garden

Tiller. It could be relate with the availability of product. Distribution channel could be more expanded.

4.3.4.1 Ranking the marketing constraints

Various factors relating to marketing were ranked by users according to their experience and stated which of them were affecting them as constraints.

Figure 4.11 Marketing Constraints

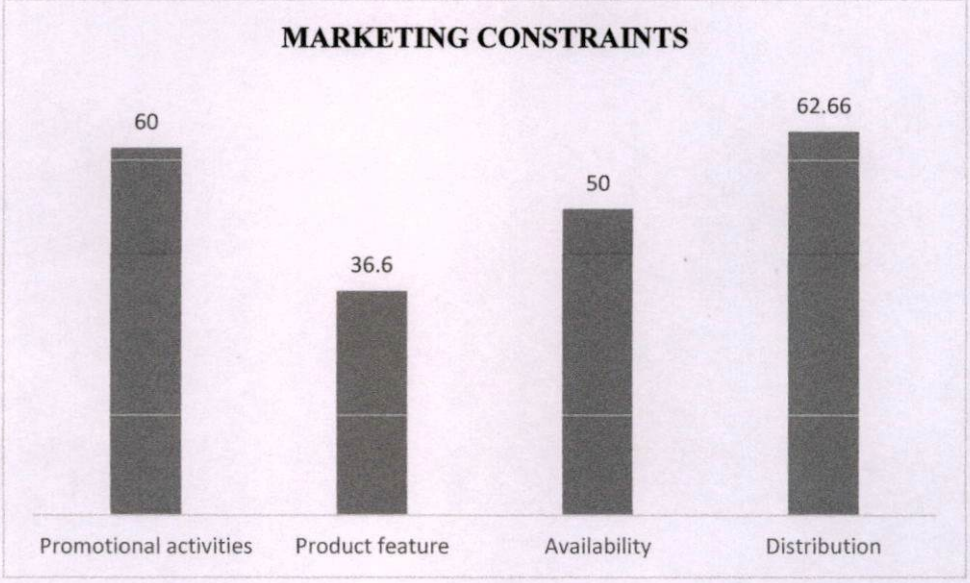


Figure 4.11 revealed that farmers faced two major constraints relating to marketing related with distribution channel and other one is about the promotional activities. They feel if there was more KAMCO outlets, it may be helpful to them for easy purchase of products.

4.3.5 Informational constraints faced by farmers in using KAMCO Garden tiller

One of the important dimension studied was informational constraint. Majorly about the customer's awareness about the product and its operation.

Table 4.15 Informational constraints faced by farmers in using KAMCO Garden tiller

Sl No:	Statements	Total Score	Index	Effect of the factors	Rank
1	Awareness about the product	90	60	Medium	I
2	Knowledge about the operation of machine	60	40	Low	II
3	Composite index		33.33		

Table 4.15 revealed majority of farmers reported that general awareness of the product was a medially affected constraint. Because this product is not much promoted towards general public. So many of us are unaware about this. It was enquired from the customers about their source of awareness. The result was as follows:

Table 4.16 Source of awareness about KAMCO Garden Tiller

Source	Percentage	Number
Magazine advertisement	44.00%	22
Exhibition	28.00%	14
Krishi Bhavan	20.00%	10
Others	8.00%	4

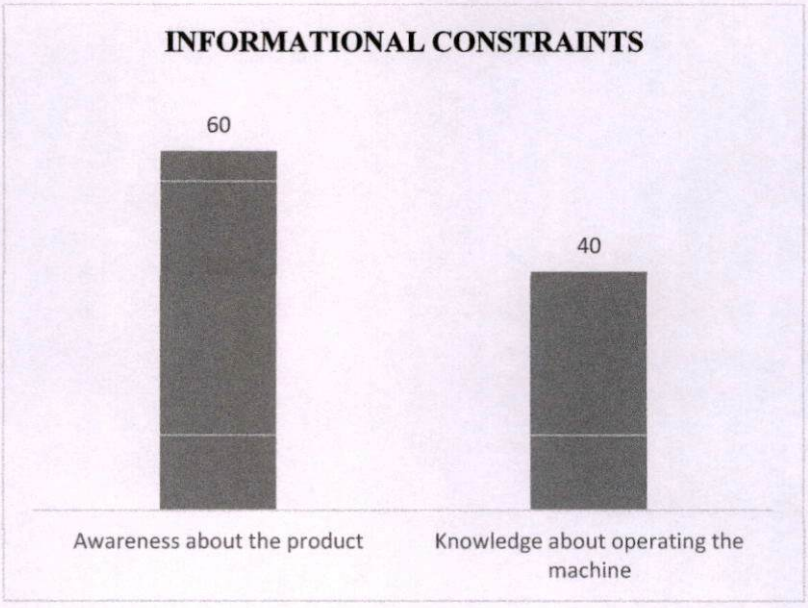
Table: 4.16 revealed that majority of respondents were aware about the product through advertisements given in the magazines. KAMCO is giving advertisement in

magazines like Karshaka Shree and Kerala Karshakan whose readers are majorly farmers. Among 50 respondents, 28 percent were aware about the product through some exhibitions conducted by KAMCO in various places. Through Krishi Bhavan 20 per cent of farmers had known about the product. Rest 8 per cent was aware about KAMCO Garden Tiller from various sources like friends, co-operatives etc. In marketing, promotion is inevitable to make people aware about the product. KAMCO Garden Tiller is not such complicated as Power Tiller and Tractor. In this period of increasing interest in kitchen gardening and organic farming in household itself can be utilized as an opportunity to increasing the sales of KAMCO Garden Tiller.

Knowledge about the operation of KAMCO Garden Tiller was not a constraint to the users. Because KAMCO itself provided customer training regarding the operation and maintenance of the machine.

4.3.5.1 Ranking informational constraints

Figure 4.12 Informational constraints



Common awareness about the product was lacking among the customers. Figure 4.12 reveals this clearly. Only farmers who are focusing on agri-magazines and attending exhibitions and all were only aware. But general public do not know about the KAMCO Garden Tiller.

4.3.6 Economic constraints faced by farmers in using KAMCO Garden Tiller

Effect of economic factors like loan and credit availability, availability of subsidy and initial investment are studied here.

Table 4.17 Economic constraints faced by farmers in using KAMCO Garden Tiller

Sl No:	Statements	Total Score	Index	Effect of the factors	Rank
1	Loan and credit availability	82	54.66	Medium	II
2	Availability of subsidy	60	40	Low	IV
3	Land holding size	73	48.66	Low	III
4	Initial investment	106	70.66	High	I
	Composite Index		71.33		

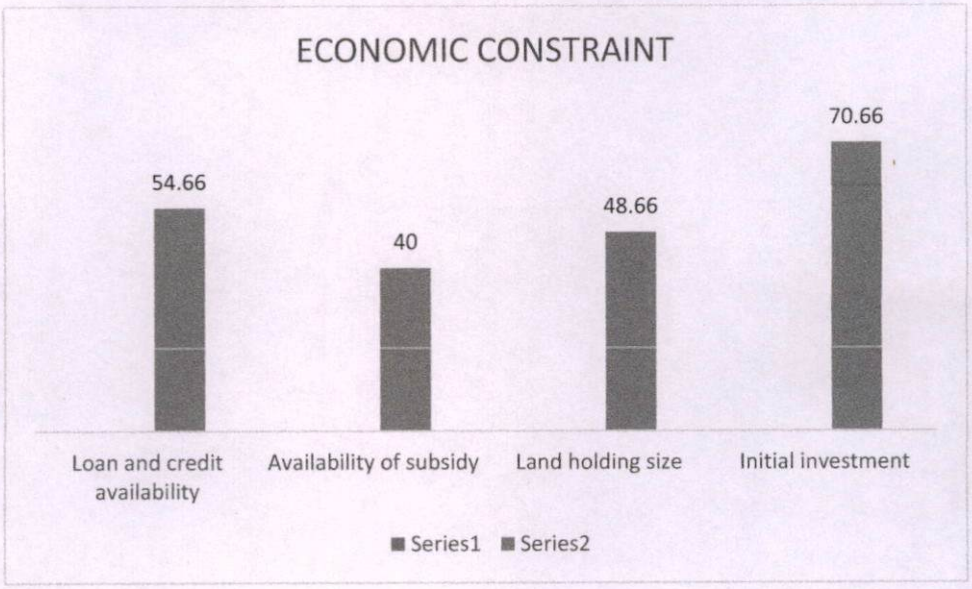
Table 4.17 revealed the economic constraints faced by the respondents. First factor, loan and credit availability affected the customers medially. Some of the farmers were unwilling to purchase garden tiller by taking loan. Because, they had purchased garden tiller for their household use. They feel it as a risk because they are small farmers who gets medium income and they are not interested in loan procedures. Repayment of loan will be difficult to them. But 20 percent of respondents felt that unavailability of loan was a

constraint to them. They felt that if loan was available, it could be helpful for small farmers like them to reduce the pressure of initial investment. Now only Indian bank and co-operative banks are providing such loans. Availability of subsidy was not a major constraint. Index score revealed that land holding size is also not a major constraint. But the index score clearly express that it could be a medium constraint. Because garden tiller is a machine suitable for small farming area. Such farmers were highly benefited. But users who had large farm size felt difficulty to use KAMCO Garden Tiller. Because it took more time to complete the work.

4.3.6.1 Ranking the economic constraints

Economic factors while using the garden tiller were ranked by the users according to their felt experience.

Figure 4.13 Economic constraints



Among the constraints, respondents ranked initial investment as the major constraint faced by them in using KAMCO Garden Tiller followed by availability of loan and land holding size.

4.3.7 Ranking the constraints faced by farmers in using KAMCO Garden Tiller

Constraints includes controllable and non-controllable. Geographic factors like climate change and geographic location cannot be controlled. While others factors can be controlled to certain extend.

Table 4.18 Constraints faced by farmers in using KAMCO Garden Tiller

Sl No	Constraints	Composite Index	Rank
1	Geographic	24.22	VI
2	Technological	102	I
3	Maintenance	98.8	II
4	Marketing	69.77	IV
5	Informational	33.33	V
6	Economic	71.33	III

Table 4.18 revealed that the major constraints faced by farmers in using KAMCO Garden Tiller are Technological, Maintenance, Economic and marketing constraints followed by, informational and geographic constraints. Geographic factors are uncontrollable while others are controllable factors. So KAMCO can study about this and take measures to make the farmers more comfortable in using KAMCO Garden Tiller.

4.4 Analysis of perceived performance of KAMCO Garden Tiller

Garden Tiller is a major product of KAMCO. Here respondents have shared their experience by using the product, which will help us to know about the garden tiller's performance.

Performance of a machines can be defined in different ways. Performance of the equipment and its effective use are greatly and directly related to the cost of production and productivity.

Table 4.19 Response about the perceived performance of KAMCO Garden Tiller

Sl No	Statement	Yes	Not much	No
1	Satisfied with the efficiency of KAMCO Garden Tiller	48 (96%)	2 (4%)	0
2	Substitution of human labor is possible	50 (100%)	0	0
3	Farm yield increased	36 (72%)	11 (22%)	3 (6%)
4	Crop varieties increased after using KAMCO Garden Tiller	28 (56%)	10 (20%)	12 (24%)
5	Better utilization of household labour is possible	25 (50%)	15 (30%)	10 (20%)
6	Help to reduce drudgery	50 (100%)	0	0
7	Leisure time increased	27	15	8

		(54%)	(30%)	(16%)
8	Interest in farming increased	35 (70%)	10 (20%)	5 (10%)
9	Health status increased	25 (50%)	12 (24%)	13 (26%)
10	Discrepancy between promise made by the company and deliverable	0	3 (6%)	47 (94%)
11	Recommend the product to others	50 (100%)	0	0

Table 4.19 showed the responds of farmers to various statements asked to them. These information provided an idea about the performance of Garden Tiller which is used by the respondents.

Mechanical efficiency measures the effectiveness of a machine in transforming the energy and power that is input to the device into an output force and movement. Majority of users (96 per cent) are satisfied with the efficiency of KAMCO Garden Tiller. According to their experience, an average of .8 unit petrol is utilized in working the tiller for 1 hour. Some stated that 20 cents can be tilled using 1 liter of petrol. Labour unavailability and high wage are the main reason why people are becoming not interested in farming. Farmers who had used KAMCO Garden Tiller opinioned that it helped them to replace 10-14 human labour per time. This is very economical too. In case of farm yield, 72 per cent responded that by using the machine their yield increased. 22 percent opinioned that it does not affect the yield much. 56 per cent farmers said that by using the garden tiller, varieties of crop in their field increased. Because majority farmers who focused on one or two crop like coconut or plantain, has introduced many other vegetable crops and all. 22 per cent feels that, it does not much affect their crop varieties in farm. 6 per cent are continuing their

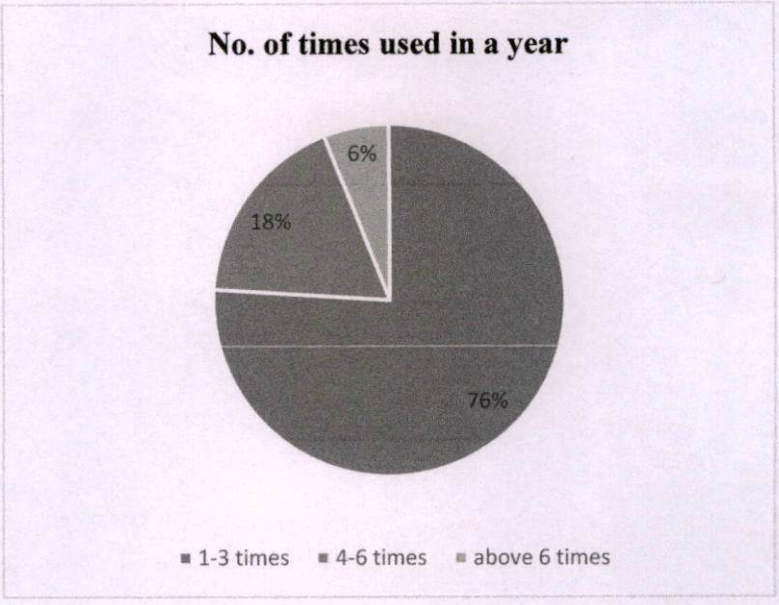
farming with those varieties they were cultivating before purchasing garden tiller. Agriculture become easy and pleasure when our family also work with us. Half of the respondents (25 per cent) replied that, involvement of family members in farming has increased while using KAMCO Garden Tiller. 30 per cent said that not much difference happened in the participation of family labour. 20 per cent never experienced that even after introducing KAMCO Garden Tiller, better utilization of household labour was not possible. Cent per cent of farmers agreed that KAMCO Garden Tiller has reduced the drudgery while farming. Majority of respondents (54 per cent) replied that by using KAMCO Garden Tiller, their leisure time has increased. Because, mechanization in agriculture reduced their working hour and increased leisure time. But 16 per cent does not agreed to this. 70 per cent farmers feels that by using the garden tiller, their interest in agriculture increased whereas 10 per cent responded that their interest level towards farming remain constant. Half of the respondents (50 per cent) replied that their health status increased. Majority of them specified that, after introduced garden tiller they started kitchen gardening and cultivated safe vegetables for household use. While 24 per cent does not feel much affect and 26 per cent feel no effect.

4.4.1 Number of times KAMCO Garden Tiller used in the farm in a year

The use of garden tiller in a year will show the productive time of the machine.

100

Figure: 4.14 Number of times KAMCO Garden Tiller used in a year



The above figure 4.14 clearly reveled that majority of farmers are using KAMCO Garden Tiller 1 to 3 times a year averagely. This shows that the number of time product in working condition was less. Rest of the time it remain unproductive. And 8 per cent said that they used the machine 4-6 times a year for various purposes in farm.

4.4.2 Number of repairs done in a year

Number of times of repair help to verify the product performance. As its number increases means poor performance.

101

Figure: 4.15 Number of repairs done in a year

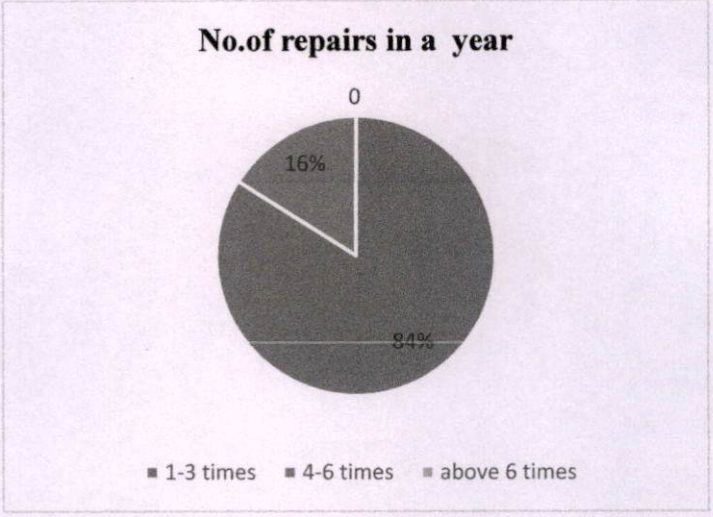


Figure: 4.15 represented that according to 84 per cent of farmers, the average number of repair work done in the KAMCO Garden Tiller is 1-3 times a year. This may be due to various reason. But majority opinioned that breakage of blade as a main problem. Rest 16 per cent said that they have done repair work about 4-6 times a year. None of the respondents replied that number of repair was above 6.

Chapter V

SUMMARY OF FINDINGS AND CONCLUSION

5.1 Major findings

The major findings of the study are summarized and presented in the sequence given below:

5.1.1 Demographic profile of the respondents

5.1.2 Factors that influenced the purchase of KAMCO Garden Tiller by its users.

5.1.3 Analyzing the constraints faced by customers in using KAMCO Garden Tiller

5.1.4 Performance analysis of KAMCO Garden Tiller

5.1.1 Demographic profile of the respondents

This formed a study on performance analysis of KAMCO Garden Tiller among its users in Kerala. Among 50 respondents only 14 per cent were female customers. This shows the participation of female in agriculture and mechanization is comparatively less.

Young generation below the age of 30 constitutes only 16 per cent of the sample. This indicated the agricultural activity is not a preferred vocational option for new generation. Older generation were interested in our agrarian culture. Business man and other employees were also customers of KAMCO Garden tiller. They prefer the machine mostly for kitchen gardening and other small scale cultivations.

People having land below 1 acre were mostly purchasing KAMCO Garden Tiller. Because in larger area it takes more time to complete the work. So it is clear that small farmers with fragmented and small land area are more benefited by KAMCO Garden Tiller.

People having leased agriculture land were comparatively low among the customers. 72 per cent respondents are having their own agricultural land.

Majority (54 per cent) of respondents are generating below 2 lakh per annum as their income. Very few (4%) are producing more than 6 lakhs. Those people are having other source of income too other than agriculture.

Being majority of respondents were of age above 50, users of KAMCO Garden Tiller have more than 10 years of experience in the field of farming. It is a positive sign that people having experience below 5 years and 3 years were also there. These people recognized the importance of farming and poison less food in the life and started cultivation in their household areas. Some old people started farming after their retirement from official job.

5.1.2 Factors that influenced the purchase of KAMCO Garden Tiller by its users.

Customers had various criteria for purchasing each product they want. Here, in case of KAMCO Garden Tiller, quality was the primary factor customers had preferred for purchasing the garden tiller. It was revealed that among the respondents, 24 per cent have other KAMCO products like power tiller and brush cutter. This trend of repeated purchase highlights the quality of KAMCO products. Brand value had another important position in purchasing the product. Because KAMCO has that much experience in the agro machinery industry. Then comes the after sales service facility provided by the company and availability of subsidy by the government. Without subsidy it was difficult to purchase KAMCO garden tiller by small farmers. Direct purchase was the major source of purchase preferred by customers. 30 per cent have purchased the product from outlets of dealers like KAICO and RAIDCO. Purchasing from retailers and other sources are little compared to other two sources. Maintenance cost and price were ranked later by the respondents. So company want to focus more on these factors.

Product specification is a major factor that attracts the customers. The product specification of KAMCO Garden Tiller was ranked using Garrett's Ranking Technique. It indicated that providing safety to the users is the most important feature of KAMCO Garden Tiller. Then came the features like fuel efficiency, weightlessness, convenience to handling and self- maintainable. Due to the petrol engine, machine does not have any starting problem even it is unused for some months. Presence of petrol engine has sixth rank.

5.1.3 Constraints faced by farmers in using KAMCO Garden Tiller

For the study, constraints were majorly divided into 6. That are geographic, technological, informational, maintenance, marketing and economic constraints. Under each major heads, there are various factors. By analysis major constraints were ranked and each factors coming under each major constraint were also ranked by the respondents. This help to know more clearly which factors make customers feel as constraint to use KAMCO Garden Tiller.

First one is the geographic constraints. In that, all the index value are below 50. None of it is a major constraint. But comparatively farm holding size is felt as a constraint for some of the respondents. Because KAMCO Garden Tiller is a machine that is suitable for small land area and is not preferred in large land holding areas. Other two factors are having index valueless than 40. That means, terrain composition and climate change is not a big constraint for using the KAMCO Garden Tiller.

According to the technological factors, the major constraints faced by farmers in using KAMCO Garden Tiller are absence of wheel attached to the engine and the non-using period of the product. These factors got index value above 80. Another constraint is the movement of machine using blades. This make a problem that whole weight of the machine should be carried out by the blades of machine while tilling. So the chance of breakage of blade is high. The study revealed that no one is affected by the operation method of the machine. Because KAMCO Garden Tiller is a farm machinery that can be self-operated. That is one of the major advantages of the product.

Majority of respondents felt that it is better to give a service package at discount rate for 1 or 2 years will be helpful to them for reducing the maintenance cost. The main repair work was happening to the blades, belt and bearing. So, it was a constraint to them. If company provide such service packages, it will make them feel more comfortable in using the product.

According to the index value it is clear that major marketing constraints faced by the customers are less distribution channel and about the promotional activities. KAMCO has no outlet with their own products. Even KAICO and RAIDCO are selling KAMCO products along with farm machineries of other companies. So customers feel it as a constraint. Promotional activities should be more generalized. Then only all type of people will aware about KAMCO Garden Tiller. As garden tiller is not a large farm equipment, people who has small land holding may become interest in starting cultivation. The problem regarding availability can also be solved by better distribution channel of KAMCO Garden Tiller.

Respondents felt that informational constraint regarding the awareness of the product only affected them. It is related with the promotional activities. Only people involved in agriculture was more aware about the product. Awareness about the product is very important in its marketing. 44% of respondents became aware about the product through the advertisements given in magazines like Karshaka Shree, Kerala Karshakan and 28 percent through exhibitions conducted by KAMCO on various parts of Kerala. Krishi Bhavan also plays a vital role in the sales of KAMCO Garden Tiller. Because 20 percent became aware about the product through Krishi Bhavans. These results shows that general people were unaware about the product. Only people who were interested in farming will go through such magazines, exhibitions and all. If more people become aware about the product, it may create interest in purchasing KAMCO Garden Tiller.

Last constraint that studied was the economic constraints. Majority feels that initial investment was a constraint faced by them. Even people who are availing subsidy also want to pay the full amount while the time of purchase.

6 major constraints were ranked by the respondents and it was analyzed using composite index value. According to that, Technological constraint was the most important constraint felt by the customers. Then comes the maintenance constraint and economic constraint in the second and third position followed by marketing constraint. Informational and geographic constraints had least composite index value.

5.1.4 Performance analysis of KAMCO Garden Tiller

Performance of a machine depends of various factors. All the above studied constraints also influence the performance of KAMCO Garden Tiller. Beyond that, respondents were asked to answer some more questions regarding the performance of KAMCO Garden Tiller.

Performance analysis of KAMCO Garden Tiller revealed that the customers were satisfied with the efficiency of KAMCO Garden Tiller. One of the major benefits they got by the performance of KAMCO Garden Tiller was, the machine has replaced an average of 10-14 number of human labour in an acre. That brings high benefit to the customers by saving money given to the labours. Average wage normally given to a labour is 500. That means farmers saved about 5000 rupees in a season. The machine can be handled by themselves and as such labour charge for operating the machine can be eliminated. Due to the performance of KAMCO Garden Tiller, 34 percent claimed their farm yield has increased. It may be due to the efficient performance of KAMCO Garden Tiller, soil became more cultivable condition. In case of crop varieties, 56 per cent revealed that they had introduced more crops in their farm after using the KAMCO garden Tiller. Many people who were majorly concentrated on one or two crops like coconut, plantain, tapioca etc. started introducing various vegetables and fruit plants. KAMCO Garden Tiller is very much suitable for horticulture purposes. But 24 per cent claimed that they had never introduced new plants, but continuing cultivation of same crops with the help of KAMCO Garden Tiller. Another exciting result is 25 percent of the total sample stated that due to the performance of KAMCO Garden Tiller involvement of family members towards farming has increased. But 20 percent customers did not agreed with that. Cent percent responded that KAMCO Garden Tiller has reduced their drudgery while farming. Due to the performance of KAMCO Garden Tiller, leisure time and interest in farming has increased. Half proportion of customers believed that their health status has increased due to the use of garden tiller. It was due to various reasons. Some started cultivation after purchasing the KAMCO Garden Tiller. And some revealed that by the performance of the machine, they started kitchen gardening for having safe vegetables in their farm itself. All these increased

their health status. Majority (94 percent) of customers claimed that there was no discrepancy between the promises given by the company and what they actually got.

5.2 Suggestions

The results from the study indicated that company need to focus on some areas to improve their market efficiency of KAMCO Garden Tiller. Some of the suggestions are given below.

i. **Extend promotional activities towards general public**

If people came to know about the interesting facts about the product, it may enhance their interest in agriculture. There is a large population having uncultivated land due to the unavailability of labour and their high wages. If the product is promoted well, people who are leading a retired life, people who are interested in kitchen gardening, people who are interested in agriculture etc. will be motivated. This will help the company to increase the sales of KAMCO Garden Tiller.

ii. **Increase the number of outlets**

Number of KAMCO outlets should be increased. It will help the customers to easy availability of products. It also help the company also. Because, now the KAMCO products are available either from the company or from dealer's outlet. In dealer's outlet KAMCO product is just only a product among other companies' farm machineries. So the product may get less opportunity. Dealers will promote the product for which they get higher commission. So, establishing own outlets in various part of Kerala can increase the market and also the profit of company.

iii. **Better promotion of the product through Krishi Bhavan**

Government may allot subsidy for enhancement of agriculture sector. It may be given as fertilizer subsidy, seed and planting material subsidy etc. But KAMCO want to impress the Krishi Bhavans to allot subsidy to farm mechanization. Then more people will purchase KAMCO Garden Tiller.

iv. **Provide service packages at discount rate for about 1-2 years.**

Spare parts like blades, belt, bearing etc. that have more chance of repair should be given in discount rate for a period of 1 or 2 years will attract more customers.

v. **Technical improvement is needed through better R & D.**

   a. **Wheels attached with engine**: It will help to provide more easy movement and reduce the wear and tear caused to blades, belt and bearing due to the weight of the machine wholly carried out by the blades.

   b. **Facility to attach pump set**: Providing facility to attach pump set will help to use KAMCO Garden Tiller for irrigation purposes when it is unused after tilling purposes. This multi-use machine will attract customers more towards the product and KAMCO will be benefited by increased sales of garden tiller.

vi. **Impress dealers by giving them more commission margin.**

vii. **Company should collect the feedback regarding the product and services rendered.**

viii. **Improve marketing strategies to attract more customers towards the product:**

KAMCO can extend their promotional activities through Kudumbasree units, schools, residence association etc. This will also help to enhance the culture of agriculture through farm mechanization.

5.3 Conclusion

KAMCO is a well-known brand of agro-machinery in Kerala. KAMCO Garden Tiller is one of the best products of KAMCO. Small and marginal farmers are the major customers. Even customers are largely satisfied about the performance of garden tiller they feel some constraints in using the product. KAMCO may take appropriate strategies to overcome those constraints and increase their sales. If this product is promoted well, it has the potential to attract more people towards agriculture. This make the company more responsible towards farm mechanization.

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APPENDIX

INTERVIEW SCHEDULE

INSTRUCTION TO RESPONDENT: Please tick (√) the answer in the corresponding boxes.

1) Name of respondent:

2) Age :

3) Gender : Male ☐ Female ☐

4) Occupation: Agriculture ☐ Business ☐ Employee ☐ Others ☐

5) Annual income:

Below 2 lakh ☐ 2-5 lakh ☐ 5-10 lakh ☐ Above 10 lakh ☐

6) Land size:

Below 1 acre ☐ 1-2 acre ☐ 3-5 acre ☐ Above 5 acre ☐

7) Land holding:

a) Owned ☐

b) Leased ☐

8) Farming experience:

1-3 years ☐ 3-5 years ☐ 5-10 years ☐ above 10 years ☐

9) How could you know about the KAMCO Garden tiller?

Magazine advertisement ☐ Exhibition ☐ Krishi Bhavan ☐ others ☐

10) Source of purchasing garden tiller:

Direct Sale ☐ Dealers ☐ Retailers ☐ Others ☐

11) Are you using any other KAMCO products?

Yes ☐ No ☐

12) How long have you been using KAMCO Garden Tiller?

Less than 2 years ☐ 2-4 years ☐ above 5 years ☐

13) Your expectation about KAMCO products:

Very high ☐ High ☐ Average ☐ Low ☐ Very low ☐

14) Rank the parameters given below for purchasing KAMCO garden tiller

a) Brand ☐
b) Quality ☐
c) Incentives and subsidies ☐
d) After sales service ☐
e) Availability ☐
f) Maintenance Cost ☐
g) Reasonable Price ☐
h) Others ☐

15) What specifications/ features do you feel as really attractive in KAMCO garden tiller?

a) Safety ☐
b) Fuel Efficiency ☐
c) Weightless ☐
d) Petrol Engine
e) Self-maintenance ☐
f) Convenient to handle ☐
g) Portable ☐
h) Others ☐

16) Constraints faced by you in using KAMCO Garden Tiller.

Sl No:	Factors	Responses		
A	**Geographic**	Unaffected	Merely affected	Highly affected
	Land holding size			
	Terrain and composition			
	Climate change			

	Technological/ Design			
	Operating method			
	Absence of front wheel			
	Condition of machine			
	Down time			
	Presence of Petrol engine			
	Single purpose			
	Maintenance			
	After sales service			
	Maintenance cost			
	Need of skilled labour for maintenance and repair			
	Unavailability of service packages			
	Spare parts availability			
	Marketing			
	Promotional activities			
	Product features			
	Availability			
	Distribution			
	Informational			

	Awareness about the product			
	Knowledge about operating the machine			
	Economic			
	Loan and credit availability			
	Subsidies			
	Initial investment			

Performance analysis of KAMCO Garden Tiller

17) Are you satisfied with the efficiency of KAMCO Garden Tiller?

Yes No

If No, Specify: .....

18) Substitution of human labour is possible by using KAMCO Garden Tiller?

Yes No

If Yes, Specify: .....

19) Do you think farm yield has increased after using this product?

Yes No

If Yes, Specify: .....

20) Did you introduced any new crop for cultivation due to the use of garden tiller?

Yes No

If Yes, Specify: .....

21) Better utilization of household labour?

Yes No

If Yes, Specify: .....

22) Did the drudgery reduced?

Yes No

If Yes, Specify: .....

23) Did you feel, your leisure time has increased due to the usage of KAMCO Garden Tiller?

Yes No

If Yes, Specify: .....

24) Do you possess better living status due to the usage of this product?

Yes No

If Yes, Specify: .....

25) Did interest in farming increased?

Yes No

If Yes, Specify: .....

26) Does your health status increased?

Yes No

If Yes, Specify: .....

27) Any discrepancy between promise made by the company and deliverable?

Yes No

If Yes, Specify: .....

28) Within a year how many time you did repair work in the machine?

1-3 4-6 more than 6

29) How many times do you used the machine within a year?

1-3 4-6 more than 6

30) Do you recommend the KAMCO Garden Tiller to others?

Yes No