A STUDY ON FACTORS AFFECTING EXTRACTION OF GROUNDNUT OIL IN CHITRADURGA DISTRICT

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Abstract: After then, the crop expanded around the world before the Portuguese brought it to southern India in the sixteenth century. The fruit of the groundnut plant is used to make groundnuts, an oilseed. It is sometimes referred to as a peanut and is frequently mistaken for a nut, even though it is actually a seed. The study's primary goal is to investigate how farming and technology antecedents affect groundnut oil extraction in the Chitradurga district. To achieve the stated goal, descriptive research approach was used. Convenient sampling was used to gather the necessary primary data from 240 groundnut farmers and those involved in the groundnut oil extraction process. A well-organized and tested interview schedule was used in the Chitradurga district to gather the necessary primary data. Regression analysis has been used to analyze such gathered data. It is found that, the unique contribution of the variables related to farming factors such as Groundnuts cultivation capability, farming groundnuts based on orders, Farming based on plan of yield, growing ground nuts based on resources, Choice of an appropriate market channel, and Availability of water for farming have found significant influence factors in predicting the extraction of groundnut oil in Chitradurga district. is accepted. The unique contribution of the variables related to technological factors such as Manual oil extraction method, Oil squeezing with cold, Hydraulic Pressure, Hydraulic Jacks, Plate Presses, and Rams Press have a significant relationship with the extraction of groundnut oil in Chitradurga district.

Keywords: Technological, orientation, Antecedents, agriculture, Groundnut Oil, Chitradurga district.

INTRODUCTION

Since the beginning of human history, groundnuts, particularly those grown in underdeveloped nations, have been utilized. It has a high calorie content and is high in protein and oil. Nearly 95% of global output comes from developing nations (Beaman, L., and Dillon, A. 2018). About 70% of this comes from Asia, where the two largest producers, China and India, together account for more than two-thirds of the world's output. Nigeria, Senegal, Sudan, and Argentina are other significant producers (Gorfad, P.S., 2018). Kernels are utilized for food, oil extraction, and as an ingredient in confections in the majority of developing nations (Glover, D., Sumberg, J., Ton, 2019). The leftover cake is used mostly for animal feed after extraction, however it is also consumed by humans. Both developed and developing nations have different quality characteristics that are crucial for groundnut end users (Rutsaert, P., Chamberlin, J., 2021). The oilseed industry is a pillar of India's rural and national economies and contributes significantly to foreign exchange profits (Daudi, H., Shimelis, H., 2018). Groundnuts are an oilseed crop that is very nutritious, commercially significant, and enhances soil fertility by adding nitrogen. For growth, it needs loose, sandy loam soil that has been drained. Groundnuts are primarily utilized to address the issue of malnutrition, enhance health, and provide smallholder farmers with cash (Fisher, M., Holden, S.T., 2018). Aflatoxin affects the product despite its high consumption and production in low land areas. One major issue with groundnut production and productivity is aflatoxin, a class of mycotoxins that are

extremely harmful to both humans and animals. The output and productivity of agricultural products are increased when high-quality, improved, and widely used crop varieties are used (Beaman, L., BenYishay, A., 2021). Groundnuts are a major oilseed crop that are grown in more than 100 nations, contribute significantly to the global economy, and are thought to have originated in South America (Richardson, M., Coe, R., 2021). The Fabaceae family, sometimes referred to as the bean, legume, or pea family, includes the groundnut or peanut species. The groundnut is an annual herbaceous plant that grows inside the ground and has feather-like leaves, yellow blooms, and a legume-shaped fruit with two to three seeds (Chandio, A.A., and Jiang, Y. 2018). Arachis oil is another name for the oil that is produced from groundnuts and peanuts. It is a mildly tasty vegetable oil that has a light yellow transparency, a clear color and luster, a nice scent, a decent flavor, and is comparatively simple to digest. Groundnut seed oil has been shown to be a great source of carbohydrates, high-quality proteins (around 28%), and different fatty acids as well as vitamin E. Around the world, groundnut oil is often used for cooking, frying, and the production of margarine and shortening (Kalinda, T., G. Tembo, & E. Kuntashula. 2014). About 45% to 55% of the groundnut kernel is made up of oil. An important part of animal feed for cattle and poultry is the oil cake, or residual meal after the extraction. Groundnut oil's flavor and scent are derived from its parent legume family (Shasani, S., Banerjee, P.K., 2020). More than 80% of the groundnut oil is made up of UFA (unsaturated fatty acids), which include around 42% oleic acid, 38% linoleic acid, 20% palmitic acid, steric acid, and arachidic acid, as well as tiny quantities of other unsaturated fatty acids. All of the B vitamins—aside from B12—as well as minerals, phosphorus, calcium, and iron are abundant in it. Of all the vegetable proteins, groundnut protein has the highest biological value (Kimaru-Muchai, S.W., 2020).

LITERATURE REVIEW

ANTECEDENTS OF AGRICULTURE

For responsible policymakers, the rates of underemployment and unemployment in rural regions are still unacceptably high. According to Vecchio, Y., and Agnusdei, G.P. (2020), the groundnut business is labor-intensive and, if successful, should logically fit into the rural setup, giving the jobless active rural residents much-needed work. Rural residents find it difficult to understand socioeconomic elements that impact the groundnut enterprise's sustainability and profitability (Orr. A., 2018). Small-holder farmers tend to be less informed and take these aspects for granted. Research is required to determine the degree, if any, of their impact on profitability. Since groundnuts are more profitable even under unsupported conditions, farmers have not cultivated groundnuts on a self-sustaining foundation where they might even choose them over other crops, like maize. In this instance, the money gained from groundnuts will be sufficient to buy enough food (maize) for more than a season, negating the need to plant just maize (Simtowe F., 2019). According to Nelson, R., Coe, R., and Haussmann, B.I. (2019), most farmers have only entered the commercial groundnut industry under contracts that provide them with inputs, technical guidance, and assured markets.

However, demonstrated profitability under typical smallholder operating conditions, assuming a normal cost and pricing structure, should help improve the crop's independent and sustainable uptake by farmers, expanding their options and creating opportunities for better and more effective resource utilization (Norton, G.W., & Alwang, J. 2020). This will assist farmers in shifting away from the limited and frequently false belief that producing maize is the only option to ensure food security. The comparative advantage of cultivating groundnuts can be taken advantage of by purchasing maize with money earned from other, more lucrative businesses (Nyumba, O., Wilson, T., 2018). It becomes much more

crucial to examine this company's profitability and determine what influences it. It is necessary to take action on two fronts to make the groundnut oil industry more competitive: (i) improving groundnut production efficiency and (ii) improving oilseed processing efficiency. According to several research on groundnuts (Konja, D.T. 2022), yield gaps are mostly caused by out-of-date varieties and inefficient usage of micronutrients like gypsum (Sawe, J., Mungâ, C.G., & Kimaro, G.F. 2018). Even if freshly released varieties outperform older kids like TMV-2, their greater adoption is also being hampered by the lack of seeds in communities. The plant population is less than ideal when it is rainfed, but it is more than what is advised when it is irrigated (Mwatawala, H.W., & Kyaruzi, P.P. 2019). Farmers are unwilling to risk their money on expensive recommended cultural practices, and adoption rates are low because of the high seed and other input costs needed at the time of sowing (40–50% of the total cost of cultivation) and the fact that the crop is primarily grown under uncertain rainfed conditions where yields and profitability vary widely (Krejcie, R.V., & Morgan, D.W. 1970). Determining groundnut production zones and seasons based on agroclimatic appropriateness and creating zone and season-specific plans are crucial to maximizing the productive potential of both high and low productive zones and seasons in order to make groundnut production more competitive. Compared to the kharif (rainy season), productivity is significantly higher during the rabi season (Oluwatoyin, B.C. 2021). Groundnut productivity is significantly greater in some agroclimatic zones of Gujarat and Uttar Pradesh than in dry areas like Anantapur district. However, groundnuts from these systems not only contribute significantly to the production of edible oil but also to better livelihoods, family nutrition, animal feed, and indirect livestock revenue (Mehmood, K., 2021). Production and price concerns, as well as Growing ground nuts based on resources, are among the most often mentioned barriers to smallholders using more inputs. Smallholder farmers in India may benefit from increased adoption rates of suggested practices if risk reduction is prioritized over production maximization (Mwaisakila, S.R., & Matemani, J.K. 2021). Therefore, the research and extension system should concentrate on low-cost innovations with a greater acceptance rate under rain-fed circumstances. Farmers must make a financial investment in order to purchase external inputs like "improved seed." Despite strong yield responses, investing in suggested practices becomes problematic when prices and output are very volatile, as is true in groundnuts (Lee, H. 2020). Insufficient groundnut farmers' market channels continue to be a persistent issue in the research region. However, farmers may make a respectable profit from groundnut production by selecting a suitable market route. India's agro-ecological conditions for groundnut cultivation are favorable. Groundnuts are grown in significant quantities across the nation, particularly in lowland areas (Mwalongo, S., Akpo, E., 2020). Determining the factors that influence a consumer's decision to choose a market channel can help identify production and sales-related problems, increase the amount of production produced, and have a substantial impact on other market channels (Omair, A. 2015). In order to promote groundnut production and sales and, consequently, increase farmers' earnings, better market access is required (Selahkwe, C., Nformi, M.I., 2021). Grain legume output and revenue might be greatly increased with greater market access (Polit, D.F., & Beck, C.T. 2010). Because they may sell their surpluses and buy the commodities and services they require, markets give agricultural households the chance to profit from trade based on their comparative advantage. Due to their inability to take advantage of the welfare benefits and income development that come with agriculture, smallholder farmers' poor market involvement in emerging nations has hindered agricultural-driven economic growth and made poverty worse. Smallholder farmers must commercialize their agricultural operations to generate marketable surpluses in order for

agriculture to significantly contribute to economic growth (Shiferaw, B., Kebede, T., 2015).

TECHNOLOGICAL ORIENTATION

This technology is used to crush around 90% of the 24 million tons of oilseeds produced in India. Conventional oil expellers are manual or animal-operated, basic mechanical machines (Ojomo A. O., Ologunnagba F. O., Alasha S. A. 2011). These devices run on the mechanical compression concept and don't need fuel or energy. They are made with low-cost parts that are frequently produced nearby (Abdulaziz Y. U. 2014). Manual oil extraction method, including hot-pressing and cold-pressing techniques, is the primary method of extracting peanut oil. Cold-pressed oil retains more bioactive components, like sterol and vitamin E, than hot-pressed oil (Olawale J. Okegbile, 2014).

When compared to hot-pressed peanut oil, cold-pressed peanut oil has a clearer look, a greater linoleic acid content, a lower low acid value, and a higher peroxide value. In addition, the meal produced using cold-pressing method has more nutrients. Oil squeezing with cold is the best way to extract oil because of the aforementioned advantages (Adesoji M. O., Kamaldeen A. Y., 2013). One technique for extracting oil is the mechanical process. Applying pressure to extract oil from the oil-bearing material is necessary for mechanical expression of oil (Kabutey, A., Heak, D., and J. Henus 2010).

Screw presses, hydraulic presses, roll presses and mills, collapsible-plate and frame-filter presses, disc mills, interlocking-finger juice extractors, and juice reamers are some of the machinery that may be used for compression. In mechanical presses, oleaginous substance meal is pressed under the influence of compression pressures (Mangesh A. Pachwade, Prof. 2013). In rural communities, oilseeds including mustard, groundnuts, soybeans, and copra (dry coconut powder) are crushed at home using non-motorized expellers. Due to their manual operation, these devices can only discharge 2 to 5 kg per hour, or 20 to 30 kg per day (Harmanto, A., Headnadi, 2009). Ghanis came from India, where they are mostly used to extract oil from sesame and mustard seeds, however they may also be used to process groundnuts and coconuts.

Ghanis can be produced locally and are traditionally run by animals (Arowosaiye M. J. 2002). They are made out of a stone or wood pestle and a wooden mortar (K.S. Zakiuddin, J.P. Modak, H.V. 2012). The pestle, which is powered by one or two bullocks or draught animals, is placed inside the mortar, which is attached to the ground, and the seeds are smashed by pressure and friction. An animal-powered ghani can produce around 10 kg of seeds every two hours, depending on the type of seeds and mortar size (TDRI, Private Communication). A lot of mechanical energy is needed for the ghani process. Five kilograms of oilseed may be processed in around an hour by a ghani powered by one bullock, or 0.35 kw. Therefore, to turn one kilogram of soybean into oil, 0.3515 or 0.07 kWh are needed (Aliyu, M. 2008). This energy usage is comparable to the maximum energy needed by small oil expellers. Although there are many various kinds of mechanical presses in use, they may be divided into two main categories: plate presses and ram presses (Nalumansi, S.R. and Kaul, R.N. 1992). In the first kind, a worm is used to push a plate or piston into a perforated cylinder that holds the oil-bearing substance. When using hydraulic jacks, caution must be taken to prevent hydraulic fluid leaks that might contaminate the edible oil (Ajao, K.R., Ajimotokan, 2009).

A variety of oil-seeds, such as sunflower, sesame, and groundnuts, as well as seeds from pumpkin, rape, watermelon, mustard, and Jatropha Curcas, may be pressed with the ram press, a manually driven mechanical press. It is possible to run the ram press constantly without removing the cake. Although the capacity would depend on the type of oilseed and its temperature at the time of pressing, the press's capacity is 14 liters of oil for an eight-hour shift, which roughly equates to pressing a 55-kg bag

of seeds (Abdulrahman, A. 2011).

Because the press is so easy to use, an operator can learn how to use it in about an hour. Only basic regular cleaning and general inspections are considered maintenance (Ibrahim, I. I. 2010). In a manually operated screw press, the material from which the oil is to be extracted is compressed slowly and at maximum pressure using a plunger (a circular steel plate), pushed down by a screw, and then placed into a cylinder with several tiny holes. A truck jack or other hydraulic equipment applies pressure in a hydraulic press that can be powered or controlled manually (Abdulsalam, A. 2013). They need a stiff, strong frame construction. The press must be stationary and cannot be moved as readily as a screw press due to the weight of such a construction (Bayero University Kano. Isiaka, M. 2005). Mesocarp (fruits), oil seeds, and nuts may be processed with hydraulic presses because they provide more pressure than a screw, which is necessary to prevent potentially hazardous hydraulic fluid from coming into touch with the food. To extract the oil from the items using the chemical extraction method, organic solvents must be used (Bashir I. D. 2014). In order to recover the oil from the sources, the solvent extraction process uses organic solvents such alcohols, ketones, chlorinated hydrocarbons, and straight chain hydrocarbons. The solvent extraction method for nuts (groundnuts) is comparable to that for seeds (cotton, soybean, etc.) (Abdullahi, U.S. 2008). Almost all of the oil in oil seeds or nuts may be extracted via solvent extraction. The solvent approach is used to extract around 98% of the oil (Dunmade, V.B. 1991). The process results in a greater protein meal and oil with superior characteristics in addition to a high oil production. According to Ewoada, M.O., El-Okene, A.M.I., and D.D. Yusuf (2008), the process often necessitates higher capital investment and oil refinement prior to use. Additionally, the usage of volatile chemical solvents poses a risk of fire explosion and potential poisoning (Abubakar Y. 2012).

STATEMENT OF THE PROBLEM

Farmers replaced areas under oilseeds, including groundnuts, with other, competitive crops due to the widespread importation of less expensive palm oil and soy oil, which together account for 52% of domestic edible oil consumption and directly compete with groundnut oil (Ojiewo, C., Ajeigbe, H., 2020). The majority of the processing facilities either shut down or ran at a reduced capacity due to the lack of oilseeds for crushing. Additionally, the low resource base of smallholder farmers and processors, the low adoption rates of upgraded technologies, and the fact that over 70% of the groundnut land is rain-fed subject the groundnut production and processing sectors to an unpredictable production environment. Improved cultivars are not widely adopted. Since the processing industry has been restricted to small-scale businesses for more than 50 years, inefficiencies remain significant (Banla, E.M., Dzidzienyo, D.K., 2018). Despite the existence of some high-yielding and profitable technologies for oilseed production and processing units, this led to the persistence of inefficiencies in both the oilseed production and processing industries. The potential advantages of cultivating groundnuts have not yet been fully realized by communal farmers, and further study is required to determine whether or not the groundnut business is viable in order to help farmers make business decisions.

OBJECTIVES OF THE STUDY

1. To examine the impact of antecedents of agriculture on extraction of groundnut oil in Chitradurga district.
2. To find out the influence of technological orientation on the extraction of groundnut oil in Chitradurga district.

HYPOTHESES

H1: There is a significant impact of antecedents of agriculture on extraction of groundnut oil in Chitradurga district.

H0: There is no significant impact of antecedents of agriculture on extraction of

groundnut oil in Chitradurga district.

H2: There is a significant influence of technological orientation on the extraction of groundnut oil in Chitradurga district.

H0: There is no significant influence of technological orientation on the extraction of groundnut oil in Chitradurga district.

SCOPE OF THE STUDY

This study aims to determine and examine the impact of farming and technological antecedents on groundnut oil extraction in the Chitradurga district.

RESEARCH METHODOLOGY

To achieve the stated goal, descriptive research approach was used. Convenient sampling was used to gather the necessary primary data from 240 groundnut farmers and those involved in the groundnut oil extraction process. A well-organized and validated interview schedule was used in the Chitradurga area to get the necessary primary data. Regression analysis has been used to analyze such gathered data.

POPULATION, SAMPLING METHOD AND SAMPLE SIZE

All ten of the Chitradurga district's talukas were chosen for the research. All smallholder groundnut farmers from the communal agricultural sector of the chosen talukas and villages in the Chitradurga district made up the sample frame. Villages from each taluka were chosen at random based on the researcher's convenience. The households of 240 smallholder groundnut farmers provided primary data. The head of the household was questioned using a structured questionnaire; in the event that this was not possible, a proxy with access to the relevant household data was interviewed.

DATA COLLECTION

Primary Data

For the first time, data was collected using a structured, self-administered questionnaire that was created and requested to be completed. Respondents were also interviewed in-person. The "5-point Likert scale" was included in a structured questionnaire. The official language of Karnataka state, Kannada, was used for a semi-structured interview with open-ended conversation.

Secondary Data

The secondary data was gathered from the following sources: selected peer-reviewed articles from bibliographic databases (Emerald, Sage journals online, Science Direct, Scopus, Taylor & Francis online, Web of Science, and Wiley (online library)). Based on their greatest influence on the field of study and their knowledge validity, peer-reviewed journals were taken into consideration. Internet-Based Resources, Reports, journals, theses, periodicals, research pieces, newspapers, etc. that have been published.

DATA ANALYSIS

The primary statistical method for determining the impact of agricultural and technical antecedents on groundnut oil extraction in Chitradurga district was multiple regression analysis. Reliability analysis is done to determine the research instrument's stability and consistency. Consistency demonstrates how effectively the model and conceptual framework are measured by the research tool.

LIMITATIONS OF THE STUDY

The Chitradurga district is the only area included by the research. For the study, only ground nut growers were taken into account. The research solely looks at how farming and technology factors affect groundnut oil extraction in the Chitradurga area. The tendency of expenditure surveys to underestimate spending is one of its limitations. Additionally, all of the data in this study was self-reported and dependent on subjective views, which is a major disadvantage. The data utilized in this study is rather "outdated," and because of chronological differences, it might not accurately reflect the current situation. The study may have made use

of sophisticated statistical methods. It's possible that the other relevant research variable was overlooked. Because some of the respondents may not be interested in providing accurate information, the information they provided may be prejudiced.

Antecedents of Agriculture

H1: There is a significant impact of antecedents of agriculture on extraction of groundnut oil in Chitradurga district.

H0: There is no significant impact of antecedents of agriculture on extraction of groundnut oil in Chitradurga district.

ANALYSIS AND INTERPRETATION

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.664[a]	.441	.419	.78875

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	112.892	9	12.544	20.162	.000[a]
	Residual	143.091	230	.622		
	Total	255.983	239			

b. Dependent Variable: Extraction of groundnut oil in Chitradurga district.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.245	.181		30.690	.000
	Groundnuts cultivation capability	***-2.171***	***.799***	***-1.985***	***-2.910***	***.005***
	Farming groundnuts based on orders	***-4.597***	***1.398***	***-3.914***	***-3.512***	***.001***
	Usage of quality seeds	-1.116	.975	-.963	-1.154	.256
	Farming based on plan of yield	***4.803***	***1.344***	***4.035***	***3.605***	***.000***
	Growing ground nuts based on resources	***3.804***	***1.066***	***3.911***	***3.570***	***.000***
	Financial strength of Farmers	-1.000	.598	-.846	-1.682	.095
	Availability of middlemen's for distribution	***-1.776***	***.743***	***-1.522***	***-2.422***	***.015***
	Availability of water for farming	***1.934***	***.661***	***1.726***	***2.940***	***.008***
	Farming of ground nuts for commercial purpose	-.676	.412	-.558	-1.650	.108

a. Dependent Variable: Extraction of groundnut oil in Chitradurga district.

The regression analysis shows that, the value of "R" indicates high degree of correlation co-efficient (.664[a]) between farming actors and extraction of groundnut oil in Chitradurga district. in Chitradurga district. R^2 measure the variation explained by the regression model is (.441[a]) being high indicating model fits the data well. Significant of F change is less than 0.05 which indicates farming factors have significant relationship with Extraction of groundnut oil in Chitradurga district. 9 variables of farming factors were used to predict Extraction of groundnut oil in Chitradurga district in Chitradurga districts.

Extraction of groundnut oil in Chitradurga district = (5.245) + ***(-2.171* Groundnuts cultivation capability) +(-4.597* Farming groundnuts based on orders)*** +(-1.116* Seeds of newly released varieties) ***+(4.803* Farming based on plan of yield) + (3.804* Growing ground nuts based on resources)*** +(-1.000* Financial strength of Farmers) ***+(-1.776* Choice of an appropriate market channel) +(1.934* Irrigation facilities)*** +(-.676* Farming of ground nuts for commercial purpose).

Since the above regression model indicates the farming factors and the values are highlighted in bold and italic are < than p value 0.05. Therefore, hypothesis statement. i.e, H1: There is a significant impact of antecedents of agriculture on extraction of groundnut oil in Chitradurga district. is accepted.

Technological Orientation

H2: There is a significant influence of technological orientation on the extraction of groundnut oil in Chitradurga district.

H0: There is no significant influence of technological orientation on the extraction of groundnut oil in Chitradurga district.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.781[a]	.585	.597	.68119

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	162.205	10	16.220	34.586	.000[a]
	Residual	113.778	229	.463		
	Total	265.983	239			

b. Dependent Variable: Extraction of groundnut oil in Chitradurga district.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.475	.357		8.099	.000
	Manual oil extraction method	***.071***	***.061***	***.197***	***1.154***	***.027***
	Oil squeezing with heat	.038	.065	.039	.469	.717
	Oil squeezing with cold	***.248***	***.086***	***.239***	***2.569***	***.018***
	Hydraulic Pressure	***.127***	***.071***	***.174***	***1.914***	***.058***
	Non mechanical Expellers	-.032	.059	-.035	-.460	.655

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.781[a]	.585	.597	.68119

ANOVA[b]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	162.205	10	16.220	34.586	.000[a]
	Residual	113.778	229	.463		
	Total	265.983	239			

Oil extracted through a slow wooden or stone press	-.028	.084	-.032	-.256	.808
Motor and mechanical pressure	***.232***	***.089***	***.241***	***2.451***	***.017***
Automatic machines for oil crushing	.166	.193	.191	1.521	.134
RAMS Presses And PLATE Presses	***-.237***	***.096***	***-.273***	***-2.644***	***.009***

a. Dependent Variable: Extraction of groundnut oil in Chitradurga district.

The regression analysis shows that, the value of "R" indicates high degree of correlation co-efficient (.781[a]) between technological actors and Extraction of groundnut oil in Chitradurga district. R^2 measure the variation explained by the regression model is (.585) being high indicating model fits the data well. Significant of F change is less than 0.05 which indicates technological factors have significant relationship with Extraction of groundnut oil in Chitradurga district. 9 variables of technological factors were used to predict Extraction of groundnut oil in Chitradurga district in Chitradurga districts.

Extraction of groundnut oil in Chitradurga district = (2.475) + ***(.071* Manual oil extraction method)*** +(.038* Oil squeezing with heat) + ***(.248*Oil squeezing with cold) +(.127* Hydraulic Pressure)*** +*(*-.032* Non-Motorized Expellers*)* +*(*-.028* Oil extracted through a slow wooden or stone press*)* +***(.232* Hydraulic Jacks)*** + *(*.166* Automatic machines for oil crushing*)* +***(-.237* RAMS Presses And PLATE Presses)***. Since the above regression model indicates the technological factors and the values are highlighted in bold and italic are < than p value 0.05. Therefore, hypothesis statement. i.e,. H2: There is a significant influence of technological orientation on the extraction of groundnut oil in Chitradurga district. is accepted.

FINDINGS

The unique contribution of the variables related to farming factors such as Groundnuts cultivation capability, farming groundnuts based on orders, Farming based on plan of yield, growing ground nuts based on resources, Choice of an appropriate market channel, and Availability of water for farming have found significant influence factors in predicting the extraction of groundnut oil in Chitradurga district. is accepted. The unique contribution of the variables related to technological factors such as Manual oil extraction method, Oil squeezing with cold, Hydraulic Pressure, Hydraulic Jacks, Plate Presses, and Rams Press have a significant relationship with the extraction of groundnut oil in Chitradurga district.

These small and medium-sized enterprises cannot afford to invest in the current groundnut oil expellers because they are too large and

costly. Its operations and maintenance aspects are additional restrictions. This illustrates, on the one hand, the constraints imposed by the availability of working capital and, on the other, the traditionalism of groundnut farming, where farmers continue to employ antiquated techniques that do not make use of contemporary production inputs like certified seeds and inorganic fertilizers, both of which require some kind of capital. This is yet another significant obstacle to attempts to convert peasant farming into contemporary commercial farming.

SUGGESTIONS

The most important factors that determine which oilseed crop will be produced are floods, implements, temperature, rainfall, cash, irrigation equipment, and food security. A variety of factors are at play when examining the factors that influenced crop investment decisions among smallholder oilseed producing farmers in Limpopo. Therefore, it is crucial to remember that diverse considerations are involved when selecting between different grain crops or oilseed crops. The procedures involved in selecting between oilseed crops and grain crops will also be influenced by a variety of variables. It is crucial to compare the suggested enhanced technology with conventional approaches while introducing new technologies.

In several instances, it was discovered that the enhanced technology was not superior to the conventional approach and instead raised labor and time requirements or led to an extra demand for raw resources. It is necessary to evaluate the availability of inputs like human and animal power. However, there are other features of oil expression technology that might assist improve rural development, such as wealth and self-employment, by raising interest in and knowledge of the technology. The use of these basic devices would undoubtedly increase the ability of the highly skilled local craftsmen in the oil extraction industry, who are unable to diversify because of a lack of innovative and flexible technology. In order to power numerous rural areas where the availability of electric energy is unreliable, a new human-powered machine is being developed. Additionally, a machine More focus is needed on the use of basic machinery by small oil producers in order to create jobs. To help them grasp the significance of designing machines before fabrication, engineers should collaborate closely with machine fabricators. The limits of the current roasting equipment can be overcome by taking into account the following: To make it easier for groundnuts to enter the roasting chamber, it can be built cylindrical and placed vertically with the top left open as an intake entrance. The highest amount of groundnut seeds typically processed by small-scale processors may be accommodated by the roasting machine's batch-wise capability.

CONCLUSIONS

In the Chitradurga area, smallholder farmers produce and market groundnuts to raise their level of living. Due to production and marketing constraints, farmers that engage in this type of farming receive minimal incomes. Different technical solutions have been made in response to the challenges faced by groundnut oil processors using conventional methods. These interventions took the shape of machines that perform sub-processing tasks including milling, kneading, roasting, shelling, and de-skinning/winnowing. Additionally, attempts were made to create screw press and hydraulic press devices that could extract oil from freshly shelled groundnut seeds. Despite their advancements, these machines still have some parts that need to be changed. Regarding the groundnut milling process, it was determined that no effort was made to focus on the extraction of groundnut oil.

DIRECTIONS FOR THE FUTURE RESEARCH

For the better growth of the edible oil processing business, further study might be done comparing the districts of Karnataka that

process sunflower seeds and groundnut oil. By carrying out comparable investigations in different districts, future researchers can validate the research findings. A far broader variety of topics should be covered by this poll. In order to properly identify the gaps in the empirical research on the issue, the study recommends that comparable investigations be carried out using the conceptual model of environmental food supply. Furthermore, groundnut oil extraction was the component that received the least amount of research, and while studies pertaining to food processing may be conducted, future studies must take this into account in order to close the research gap.

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