

Analyzing The Impact Of Financial Schemes In Boosting The Lives Of Female Rural Population In India

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Abstract

In this paper we have made an attempt to study the success (performance), reach and to analyse PMMY, our paper is especially focused on two major aspects, firstly how these financial schemes help in promoting female entrepreneurship and secondly understanding people sentiments on these financial schemes. Pradhan Mantri Mudra Yojana (PMMY) is a flagship scheme of the Government of India to “fund the unfunded” by bringing such enterprises into the formal financial system and extending affordable credit to them. The present study will evaluate how these acts are impacting female financial literacy, and what can be improved to aid female in rural areas on the path of financial literacy, by doing an Exploratory Data Analysis (EDA) on the data available from 2015 to 2022, apart from analyzing the data and concluding about a financial scheme, it is very important to understand the sentiments of the people for whom the schemes are designed for and these is achieved by doing sentiments analysis using Natural Language Processing (NLP).

Keywords: Pradhan Mantri Mudra Yojana, Exploratory Data Analysis (EDA), Natural Language Processing (NLP).

Introduction

Female financial literacy and independence is a legitimate problem, especially among women in rural areas for several reasons discussed further in the paper. Being financially independent is becoming an increasingly important factor as the world progresses towards a more monetary-based stance. Being dependent on the man being the sole breadwinner is not only a backward ideology but also enhances female inferiority. It is also impractical as inflation and the importance of monetary factors only increases. In India, gender discrimination is the main issue negatively affecting the socio-economic development of women Razvi and Geneet 2014.[8]. There is a huge deep-rooted gender discrimination issue etched into rural India, with female infanticide rates reaching new peaks every day. Women are not given the same opportunities as men, not only in rural India but everywhere in the world Biswas and Soni, 2015.[6]. Many companies offer lower pay grades to women when compared to men for the same posts, women are discriminated against at job interviews and acceptances, virtually everywhere. In India, it is known that women in rural areas do not have access to education because of traditionalist mindsets prevailing in their families. Most rural women have the least access to health care Kundu 2010.[7]. Women in villages are mostly housewives and work in farm fields for their livelihood. In the paper by Yasaswini, a case study was performed to enquire about the socio-economic development of women in Arepalli, Rangampet, Chandragiri Mandal, Chittoor District of Andhra Pradesh noted that most of the female population in these areas

earned their major source of income through working in agricultural fields, tailoring, selling vegetables and fruits, and sweeping educational institutions Yasaswini 2017.[9]

Thus, from this, it can be inferred that the women of the region where the study took place were uneducated, therefore pointing to the need to address the socio-economic development of women in the area. Thus, women being financially independent is essential for which the Indian government has set up numerous acts in places such as the Pradhan Mantri Mudra Yojana (PMMY) and others. PMMY enables a small borrower to borrow from all Public Sector Banks such as PSU Banks, Regional Rural Banks, Cooperative Banks, Private Sector Banks, Foreign Banks, Micro Finance Institutions (MFI).[2], and Non-Banking Finance Companies (NBFC) for loans up to Rs 10 lakhs for non-farm income generating activities. The scheme was launched on 8th April 2015 by the Hon'ble Prime Minister.[2]

Under the aegis of Pradhan Mantri MUDRA Yojana, MUDRA has already created the following products/schemes[1]

- Shishu: covering loans up to 50,000/-
- Kishor: covering loans above 50,000/- and up to 5 lakh
- Tarun: covering loans above 5 lakh and up to 10 lakh

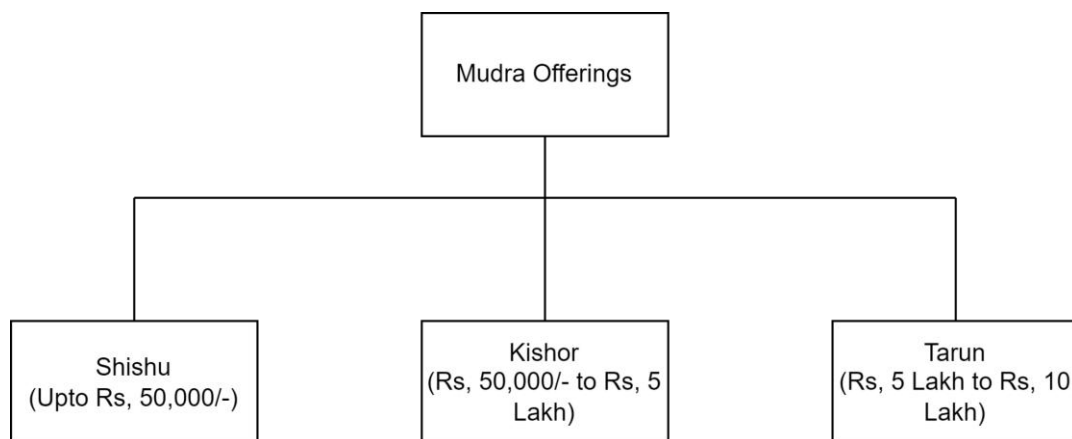


Fig 1.: PMMY products

After all these, understanding people's opinion and sentiments is very important, their understanding, and advantages are quite a debated topic on Twitter. The term, also known as opinion mining, is the area that deals with judgments, responses as well as feelings generated from texts. It is extensively used in fields like data mining, web mining, and social media analytics.

Sentiment Analysis reviews can be your single source of truth to understand what people at large are trying to communicate to you and therefore its analysis becomes important. Gaining in-depth knowledge of people's emotions is crucial to the government as it allows one to gain an overview of the wider public opinion behind certain topics. Automatic analysis of people's opinions in the form of surveys, questionnaires, and social media forums allows the government to hear their customers about the product and services. This helps them to understand their customers better through sentiment analysis and opinion mining.

Literature Review

Financial Inclusion is one of the most treasured strategies in India. Ritesh Dwivedi et al.[3] proposed that the Financial Scheme can be extended to personal sectors other than farms and factories. They can start a loan funding

of less than Rs 50,000 so that the gap of 0- 50k can be fulfilled. There should be more concentration on the minority sector. MUDRA cards can be used more intensively in the future. Women entrepreneurs should be more encouraged to wipe out the difficulties faced by them. Vijay Pal, et al.[4] proposed that the PMMY scheme is mainly concerned with the micro-enterprises of non-farm enterprises whose credit needs are below Rs. 10 lakhs & all the credits provided for income & employment activities are known as MUDRA loans Singh. Banks in Himachal Pradesh have disbursed the loans under this scheme amount to Rs. 2,900.07 crores and are covering 1,72,864 micro and small entrepreneurs; it includes Rs. 1220.91 crores to 66,346 new micro-entrepreneurs. The MUDRA scheme aims to provide financial support for small businesses that generate employment for most of the Indian working population and create an inclusive, sustainable, and value-based entrepreneurial culture. The status of these financial inclusion initiatives in H.P. is shown as a rising trend. Mahajan, Yogesh, et al. [5] Mudra loans have seen a steady increase in the sanction of loans to micro-enterprises in India. A major portion of the loan category belongs to the Shishu category. The number of loan sanctions and the sanctioned amount has been increasing year on year in Maharashtra state. The percentage increase in the sanction of loans is more than 25% and 31% year on year. It shows that banks are implementing government schemes in a very positive way. The participation of the weaker sections (SC/ST/OBCs) of the society in the PMMY program was at 55%, in terms of loan accounts, and 34% in terms of the loan amount sanctioned. Also in 2017-18, 40% of the loan amount sanctioned was the share of women borrowers in the total loan amount sanctioned. The share of women in the Shishu category is at 75%, in terms of the number of accounts under Shishu, and it formed 95.78% of the loan accounts of women borrowers. Maharashtra is among the top three states in the last three years. It shows the success of Mudra in Maharashtra. Out of the total loan sanctioned for all of India, 13 to 15% is sanctioned for the state of Maharashtra. The share of SC, ST, and OBC categories were 18%, 5%, and 32%, respectively, in terms of the loan accounts sanctioned. But the major portion of their share belongs to the Shishu category.

Exploratory Data Analysis (EDA)

EDA is generally the process of visualizing datasets to find out different patterns in the datasets, analyzing the anomalies behaviour of the datasets, and building assumptions or hypotheses based on the understanding of the data. This paper is majorly centred on the results and analysis of the exploratory data analysis (EDA) of the data compiled and collected. EDA helped summarize the integral characteristics and identify crucial trends in the data by using visualization methods. In using these visualization methods, EDA manipulates data helping in discovering patterns, spotting anomalies, testing hypotheses, or checking assumptions. EDA is time efficient and identifies accurate trendlines and correlations, therefore proving to be beneficial to the study and analysis of the data, thus helping to arrive at fruitful conclusions to test the hypothesis. Secondary sources are works that analyze, interpret, or merely describe historical or scientific events. They consist of data and information which are not collected first-hand by the user. Some examples of this may include books, movies, and information and data found online or other sources. Secondary sources help gain a holistic view of the topic and provide people with more complete and reliable sets of data. They also give more insight. Primary sources, on the other hand, can prove to be incomplete, unreliable, and at times, biased. When one relies solely on primary sources for their data and information, one is only relying on their own interpretation of the content, not leaving any scope for contrasting opinions which may contribute to further developing the argument and making the research more insightful and well-rounded. The data have been rounded up with the help of secondary sources. The data has been gathered from papers of contemporary researchers, all of these papers dating back to a maximum of 2 years from when this paper has been written, also data is being gathered from the official website of PMMY.

The below data shows the performance of PMMY from the financial year 2015 to 2022 and it is limited only to women entrepreneurs.

Table 1. Sishu year-wise data distribution

Year	Shishu (Loans up to Rs. 50,000)			
	No Of A/Cs	Sanctioned Amt (in cr)	Disbursement Amt (in cr)	Outstanding Amt (in cr)
2015 -2016	27103118	69038.97	50640.02	36969.45
2016-2017	28472344	66997.91	66185.86	46684.74
2017-2018	32144132	80371.59	78921.72	56150.59
2018-2019	33403579	96253.15	93977	67437.83
2019-2020	35717217	109659.78	109222.18	78549.09
2020-2021	27753288	74490.46	73872.15	60901.69
2021-2022	30441921	89621.66	89233.92	68390.09

In the above table Shishu shows much better progress for the F.Y 2019-2020 as compared to F.Y 2020-2021 & 2021-2022 and could be mainly due to the covid situation, still, PMMY Shishu has shown remarkably good growth over the years.

Table 2: Kishore year-wise data distribution

Year	Kishore (Loans from Rs. 50,001 to Rs. 5.00 Lakh)			
	No Of A/Cs	Sanctioned Amt (in cr)	Disbursement Amt (in cr)	Outstanding Amt (in cr)
2015 -2016	473536	9068.03	8675.43	7468.66
2016-2017	624925	9541.63	8733.38	15938.01
2017-2018	1335192	16586.84	15749.53	13966.68
2018-2019	2875392	26741.23	25666.77	25034.39
2019-2020	2988307	26476.69	25160.37	22000.74
2020-2021	5468211	50730.64	48817.86	43905.05
2021-2022	7892778	70027.9	68661.23	57916.32

In the above table Kishore shows much better progress for the F.Y 2021-2022 as compared to Shishu, PMMY Kishore has shown a much gradual movement over the Years.

Table 3. Tarun year-wise data distribution

Year	Tarun (Loans from Rs. 5.00 to Rs. 10.00 Lakh)			
	No Of A/Cs	Sanctioned Amt (in cr)	Disbursement Amt (in cr)	Outstanding Amt (in cr)
2015 -2016	51611	4076.55	3874.98	3343.16
2016-2017	49625	3750.13	3330.54	2917.9

2017-2018	78914	6295.7	5499.3	5015.79
2018-2019	783591	10039.23	9509.46	10213.62
2019-2020	397825	9045.4	8463.68	7891.86
2020-2021	82105	6082.24	5680.12	5308.26
2021-2022	94560	6772.91	6546.72	6068.03

In the above table Tarun shows much better progress for the F.Y 2018-2019 as compared to Shishu and Kishore, PMMY Tarun has shown a drop in progress from F.Y 2019-2020.

Table 4: Overall year-wise data distribution

Year	Total			
	No Of A/Cs	Sanctioned Amt (in cr)	Disbursement Amt (in cr)	Outstanding Amt (in cr)
2015 -2016	27628265	82183.55	63190.43	47781.27
2016-2017	29146894	80289.68	78249.77	65540.65
2017-2018	33558238	103254.12	100170.55	75133.06
2018-2019	37062562	133033.62	129153.23	102685.84
2019-2020	39103349	145181.87	142846.22	108441.69
2020-2021	33303604	131303.35	128370.13	110114.99
2021-2022	38429259	166422.47	164441.88	132374.45

Now considering the overall performance of PMMY from the financial year 2015-2016 to 2021-2022 the PMMY has shown a very gradual moment, below chart explains the table above.

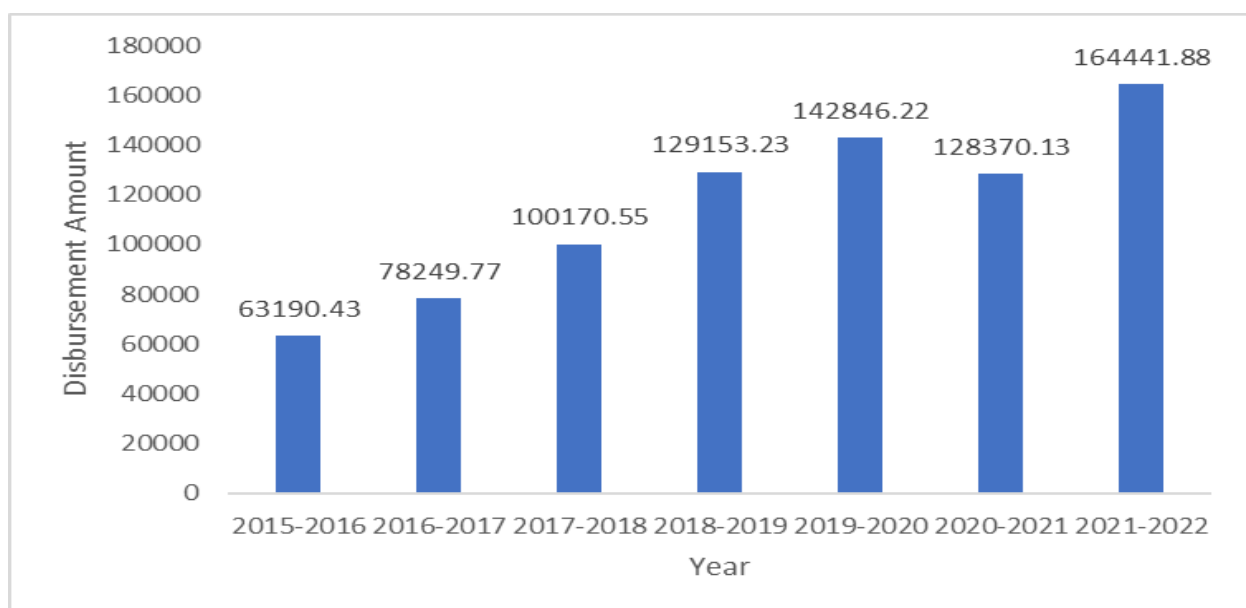


Fig 2: Visualization of Disbursement amount over the last seven years

The above figure is the graphical representation of the overall progress of PMMY from 2015-2022, we can see a slight drop for the F.Y 2020-2021 But considering covid conditions it has explicitly performed well over the years.

They lack Formal Education, As discussed before, women are not given the same opportunities, especially in rural areas. This also includes the selection of kids who are sent to schools in families and how they are perceived. Most girls drop out forcefully before they can even finish grade 12, a lot of them dropping out during high school itself so they can help at home. They often leave school resulting to premature or child marriage where they are sold off by their parents to older people at a younger age; some parents even pay huge amounts of money in the form of dowry just to have the daughters of their hands. The fact that they are deprived of a substantial amount of primary education and awareness attributes to what holds them back from financial independence and from then earning.

They lack the required skill, Women in rural areas also lack the required skill because they are prematurely pulled out of school for numerous reasons as mentioned before. Because of being deprived of formal education, they lack the opportunities and resources to derive the necessary skills needed, which is why they lack the skills needed to go a step closer to financial independence.

Whether society plays a role in it? It does. It looks down on the women's those who are overly ambitious in the rural areas according to their ideology, women are not meant to earn, they are to take care of their childrens and husband, also home; they virtually have no more responsibilities. That is what they are taught ever since they were born according to rural society – going out and trying their best to support themselves is going against everything they know about the world and themselves.

The male does not want to work with the females, this is a mirror of the toxic masculinity culture harvested in the rural areas where men put themselves on a pedestal, self-appointing themselves as the superior race. Working alongside women requires them to see them as equals and not subordinates, which means accepting and bringing themselves down from their pedestal. Because of the traditional narrow-minded mindset resulting in hindering the progress of women in every field possible.

Whether the financial situation is holding them back? It is as if they are guilting into staying at home and supporting their husbands for the majority of their life as there is a huge risk and expense for them to go out into the real world to earn initially as once they step out to find a job, they need to find someone to stay at home to keep the house in order as they wouldn't be around to do that anymore. Hiring house help in the rural area is not easy and the financial situation of the family may account for what is holding women back even with pillars of support from their spouse and family.

Lack of self-confidence, the lack of a basic educational background paired with the narrow mindset they are surrounded by with everyone around them reminding them how they are inferior to the men and their only function is to get married off and fend for their husband, reducing them to nothing but an object. This cultivates a lack of self-confidence leading them to not believe in themselves and back themselves up causing them to take a huge step back from financial independence.

Mobility constraints, Because of the way women have been perceived and what they have been taught as mentioned before, the frowning down upon, lack of resources and support, and lack of self-confidence all work towards creating mobility constraints for them.

The rural female population lacks an agenda in life, Because the rural female population was never given a chance to flourish on their own and explore their likes and dislikes and what they are good at academically or artistically, they never got an opportunity to form an agenda, and as a result, they tend to lack a career-based agenda in life.

Sentiments Analysis using NLP

NLP stands for Natural Language Processing, which is a part of Computer Science, Human language, and Artificial Intelligence. It is the technology that is used by machines to understand, analyze, manipulate, and interpret human languages. It helps developers to organize knowledge for performing tasks such as translation, automatic summarization, Named Entity Recognition (NER), speech recognition, relationship extraction, and topic segmentation There are the following steps to build an NLP pipeline

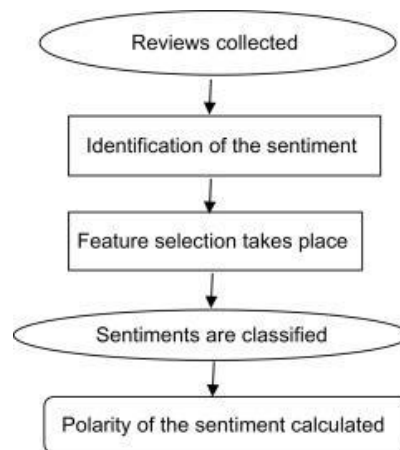


Fig 3. NLP Pipeline Flowchart

A NLP Pipeline starts with collecting the data to train a model, the data which we worked on was movie review data which has three sentiments as a dependent parameter namely positive, negative and neutral and we are here doing a multiclass classification and the library used to do the natural language processing is the nltk library from python. The raw data is converted to clean text using segmentation followed by lemmatization and then chunking giving us the clean text as shown in the below image

	Tweet Id	Datetime	tweet	clean_text
0	1549359470538473472	2022-07-19 11:44:18+00:00	RT @anshgupta64: • As of December 2021, a tota...	RT As of December 2021 a total of 44 23 crore ...
1	1549351047537106944	2022-07-19 11:10:49+00:00	RT @Ravindranathbjp: Indira Gandhi nationalise...	RT Indira Gandhi nationalised banks purposeful...
2	1549348341175263233	2022-07-19 11:00:04+00:00	RT @UFS_Digital: Account can be opened in any ...	RT Digital Account can be opened in any bank b...
3	1549327575645708288	2022-07-19 09:37:33+00:00	@vaibhavUP65 Yes PSBs are forced to give SC/ST...	Yes PSBs are forced to give SC ST minority loa...
4	1549325959450755073	2022-07-19 09:31:08+00:00	RT @Ravindranathbjp: Indira Gandhi nationalise...	RT Indira Gandhi nationalised banks purposeful...

Fig 4. Difference between clean and raw tweets

The vectorizer which is used is Tf-IDF Vectorizer to then convert these collections of vocabularies into numbers. Term frequency-inverse document frequency is a numerical statistic that is intended to reflect how important a word is to a document in a collection or corpus. After getting TF-IDF scores for our vocabulary. TF-IDF also gives larger values for less frequent words and is high when both IDF and TF values are high i.e., the word is rare in all the documents combined but frequent in a single document. After doing all these steps the trained model is then used on Twitter tweets which are extracted by a library named tweepy and then sentiments are analyzed of the hashtag PMMY, and the below image shows the final output.

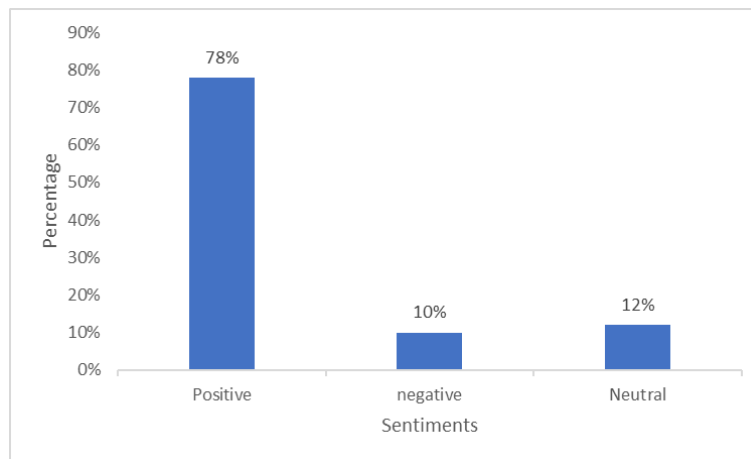


Fig 5. Sentiments analysis of #PMMY Tweets

The above image shows the results from twitter analysis. From the analysis we can roughly see that 78% of the twitter population are talking positively about the yojana, 12% of the population are having a neutral stand, and 10% of the tweeter population are not happy with the yojana. The sample which is taken into consideration is 1000 latest tweets related to the yojana.

Source of data: <https://www.kaggle.com/c/sentiment-analysis-on-movie-reviews>

Future Scope

As there were only a sample of 1000 tweets which we have considered for the analysis, the result from the sentiment analysis cannot be said as 100% reliable as these schemes are designed for rural people especially and it's in the rural areas majority of the people don't have access to the internet. Taking this factor into consideration, the above tweets on which we have done sentiment analysis, majority of the tweets won't be from the rural areas, so to understand the sentiments of people in a better way it is important that the sentiments of people from both rural and urban areas are taken into consideration. Here just an attempt is made to understand people's sentiments, considering technology evolving so fast in this 21st century, human adapting themselves so quick towards new trends and technologies it is expected that we would have more people participating in reviewing products on social media platforms and eventually will help business to understand its customers better and we can have more accurate sentiments analysis allowing the GOI to understand what updates and changes need to be done to make a Scheme Successful.

Conclusion

With this study we can conclude that PMMY is a great initiative taken by the government of India. There is a big change in microfinance after the government bought this scheme for the people. The scheme will help the unfunded population (the weaker section), low-income group, and will increase the competition. Financial inclusion such as PMMY increases the opportunities for refinance and requirements of credit. The introduction of the national plan PMMY with other types of financial inclusion initiatives, yields a very valuable result. Also, people supporting this yojana and giving positive comments on social media is a big thumbs up for the same

The PMMY scheme will definitely to take our country forward to the future. MFIs contributed significantly to the financing of women under PMMY. It perceives that because of the dispatch of this plan, monetary consideration has expanded towards a positive heading. So, it can be said that if it is implemented properly, it may work as a game-changing financial inclusion initiative for the Government of India and may boost the Indian economy.

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