

## A STUDY ON SUSTAINABILITY AND RISK MITIGATION IN NATIONAL PENSION SCHEME INVESTMENTS

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### Abstract

Sustainability and risk management are increasingly critical in pension fund investment strategies. Pension funds provide secure returns for beneficiaries over the long-term, incorporate ESG factors into their portfolios to mitigate risks and capture new opportunities. It is a strategy to align with SDGs. This paper explores the role of sustainability in shaping risk management frameworks within the NPS, examining how ESG considerations enhance resilience against market, regulatory, and reputational risks. The study was conducted with the help of a questionnaire, and sample used is 75. Through case studies and analysis of NPS strategies, the paper highlights challenges and the impact of sustainability-driven risk management on long-term fund performance. The findings underscore the significant relationship between sustainability and risk management.

**Keywords:-** National Pension Scheme, Sustainability, Risk Mitigation, ESG Considerations, Pension Fund.

The important investment opportunity that deals with retirement life is a Pension fund. It further helps old people to protect their lives from financial constraint, quick investment recovery, and aligns societal goals. In the current scenario, sustainability

and risk management are becoming important aspects of every business, and they also help the pension system to operate, invest, and plan for the future. As investors demand investment operations in pension funds, the role of ESG (Environmental, Social and

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Governance) factors has increased rapidly.

Sustainability in pension fund management focuses on long-term environmental risk, social factors, community impact and financial return. If we properly identify these factors and take appropriate measures, then the invested pension fund value will be safe. In the pension fund risk management helps to anticipate and mitigates various risks such as reputational risk, longevity risk, market risk, etc., from market fluctuations and regulatory changes. It protects investor's assets from threats and enhances resilience. These two concepts of sustainability and risk management make pension funds more responsible and future-oriented. By maintaining sustainability and implementing risk mitigation, pension fund provides secure retirement outcomes.

### **Significance of the Study**

This article highlights the role of sustainability and risk mitigation in the National Pension Scheme (NPS), by analysing the role of sustainability in shaping risk management frameworks and ESG considerations that enhance resilience against market, regulatory, and reputational risks for investors. The article provides a positive influence of the National Pension Scheme. It focuses on the importance of sustainability and risk mitigation in an investment option, like National Pension Scheme.

### **Statement of the Problem**

The increasing instability of the global financial market leads to regulatory framework and strengthened awareness

of ESG issues, which have created new challenges for pension fund institutions. Traditional risk management strategies, like market and regulatory risk are no longer sufficient for today's risk management by investors.

Sustainability consideration is a vital element in shaping investment and risk management decisions, as they influence long-term value creation, reputation, compliance and so on. Limited research exists in the field of sustainability and ESG practices in NPS. This creates a gap in understanding, whether sustainability approaches can effectively influence to mitigate risk and increase confidence in NPS investors.

So, this study explores the role of sustainability in shaping risk management frameworks as well as examines how ESG considerations enhance resilience against market, regulatory, and reputational risks for investors. By addressing this gap, it also helps the policy makers, pension fund managers and NPS investors to develop a new investment strategy for pension.

### **Literature Review**

(Agnese et al., 2024) evaluated the relationship between pension fund performance and ESG attention in asset allocation with the existence of gender dissimilarity. They showed that gender, finances, and return have influenced ESG practices, and the existence of sustainability exists. This study focused on broad gender diversity and evaluated the extent to which companies need to pay attention to this issue and ensure a gender-balanced board.

According to (Zhao et al., 2024) he examined that the income and

expenditures of urban workers by recreating the effect of delayed retirement from 2021 to 2050 using an actuarial model of the pension insurance fund and concluded that there is a shortfall for 2027 and after. In this paper they suggested that an adaptive retirement policy should be introduced for different groups of people for their future.

(Mantilla-Garcia et al., 2024) focused on the objectives and incentives of Defined Contribution plans with the help of liability driven strategies and performance metrics used by fund manager and results lead to incomplete performance. They found out that these performance metrics provide misleading information about the pension fund's risk and its performance, as they ignore conversion rate of retirements and the large variation in retirement income.

On the point of view of (Di Giacinto et al., 2024) this study mainly set a goal to find a model for investment and controlling longevity risk, and it guarantees a minimum pension savings. With the portfolio insurance approach, they can make an apt portfolio for their residual wealth. They followed the approach, purpose-oriented proportional portfolio insurance (PO-PPI) during accumulation time and they aimed to maximize expected utility of terminal surplus between final wealth of the fund and annuity value.

(Darmaraj & Narayanan, 2019) in their study, they evaluated the financial sustainability of Civil Service Pension Scheme in Malaysia by estimating the pension deficit over a period of 75 years. And they analysed the impact of changes

in three policy variables like retirement age, contribution age and replacement rate. They found out that the non-contributory scheme is not sustainable. Pension funds are inevitable due to longer life expectancy.

### Objectives

1. To explore the role of sustainability in shaping risk management frameworks within the NPS regarding investors.
2. To examine how ESG considerations enhance resilience against market, regulatory, and reputational risks for investors.

### Hypotheses

**H01:** There is no significant difference in the sustainability practices and the risk management framework within the National Pension Scheme investors in Kerala.

**H02:** There is no significant difference in ESG consideration and resilience against Market, Regulatory and Reputational Risk for National Pension Scheme investors in Kerala.

### Scope of the Study

This study mainly focuses on the Thiruvananthapuram district in Kerala. The main aim of this study is to understand the role of sustainability in risk management within the National Pension Scheme. This study also examines ESG consideration to enhance the resilience against market, regulatory and reputational risk for the National Pension Scheme investors.

### Research Methodology

The present study is analytical in nature. The primary data were collected

through a structured questionnaire from 75 respondents in the Thiruvananthapuram district of Kerala. And secondary data were obtained through research articles, web articles, published reports, and official websites of relevant agencies. The convenience sampling method was used to collect primary data, which were then analysed using IBM SPSS. Statistical tools like the one-sample Wilcoxon signed rank test, frequency, etc, were used for the analysis of data, keeping in view the objectives of the study. The Wilcoxon test was used to test the hypotheses of the study, because, while testing normality, it was shown that the data are not normally distributed.

### Results and Discussion

In this study so many factors are analysed for understanding the role of sustainability and risk mitigation in the National Pension Scheme. To identify the role of sustainability and risk management in the National pension scheme, respondents were asked to list out their characteristics and it is mentioned in Table 1 of the study.

The sample characteristics, including gender, age group, employment status, type of pension scheme, investment duration, and role in the NPS of investors, are presented in Table 1.

From Table 2, it is evident that 36 per cent of the respondents are not familiar with the concept of sustainability. And only 4 per cent of the respondents are very familiar with the concept of sustainability.

In Table 3, the importance of investing in environmentally and socially

responsible companies was listed and from this table, we came to the conclusion that 36 per cent of the respondents think that it is very important to invest their income in environmentally and socially responsible companies.

From Table 4, it is evident that all tested factors had medians significantly greater than zero. From the factors like identify risk, respond to risk, measure progress, find new opportunities, improve reputation and regulatory compliance shows that the role of sustainability had a significant effect on shaping risk management. With the help of a significance level of 0.000 for all factors, it is evident that the null hypothesis (H01) can be rejected.

Factors like risk management, regulatory compliance, measuring progress, investor confidence, access to capital, stakeholder relationships and long-term value creation show that ESG-related outcomes enhance resilience in the pension fund investment framework. Since the significance level is 0.000 for all factors, the null hypothesis (H02) will be rejected.

### Findings of the Study

1. From this study, it is revealed that 68 per cent of the respondents are Female. The majority of the study's age group falls within 31-45, i.e., 52 per cent. Most of the respondents were employed by the state government (29.3 per cent). The majority of respondents don't even know which type of pension schemes they are investing in. Respondents invest in a pension fund

**Table 1**  
**Sample Characteristics**

Demographic Profile of Respondents		Frequency	Percentage
Gender	Male	24	32.0
	Female	51	68.0
	<b>Total</b>	<b>75</b>	<b>100</b>
Age Group	18-30	33	44.0
	31-45	39	52.0
	46-50	1	1.3
	51-65	2	2.7
	<b>Total</b>	<b>75</b>	<b>100</b>
Employment	Central Government	21	28.0
	State Government	22	29.3
	Private Sector	21	28.0
	Others	11	14.7
	<b>Total</b>	<b>75</b>	<b>100</b>
Type of Pension Scheme	Defined Benefit	4	5.3
	Defined Contribution	33	44.0
	Not Known	38	50.7
	<b>Total</b>	<b>75</b>	<b>100</b>
Investment Duration	Less than 1year	40	53.3
	1-5year	23	30.7
	More than 5 years	12	16.0
	<b>Total</b>	<b>75</b>	<b>100</b>
Role in NPS	Individual investor	48	64.0
	Financial investor	3	4.0
	Pension fund manager	12	16.0
	Others	12	16.0
	<b>Total</b>	<b>75</b>	<b>100</b>

*Source: Primary Survey.*

for less than 1year. The role of the investors is individual in nature.

2. Table 2 suggests that the concept of sustainability is less familiar to the respondents, and only a few, i.e., 4

per cent of the respondents, are very familiar with this concept of sustainability. 20 per cent of the respondents are familiar with the concept. 6.7 per cent have a neutral opinion on the familiarity of the

**Table 2**  
**Familiarity with the Concept of Sustainability**

Familiarity	Frequency	Percentage
Not familiar	27	36.0
Somewhat familiar	25	33.3
Neutral	5	6.7
Familiar	15	20.0
Very familiar	3	4.0
<b>Total</b>	<b>75</b>	<b>100</b>

*Source: Primary Survey.*

**Table 3**  
**Importance of Investing in Environmentally and Socially Responsible Companies**

Importance	Frequency	Percentage
Not important	5	6.7
Somewhat important	22	29.3
Neutral	9	12.0
Very important	27	36.0
Extremely important	12	16.0
<b>Total</b>	<b>75</b>	<b>100</b>

*Source: Primary Survey.*

concept, and 33.3 per cent of the respondents are somewhat familiar with this concept.

- In Table 3, we have discussed about the importance of investing in environmentally and socially responsible companies. In this study, we found out that respondents consider it very important to invest in environmentally and socially responsible companies. The respondents of 29.3 per cent think that it is somewhat important. The 16 per cent of respondents stick to

the opinion that it is extremely important to invest in environmentally and socially responsible companies, the 6.7 per cent of them do not feel that it is important to invest their income in environmentally and socially responsible companies.

- Table 4 consists of the results of hypothesis testing, all variables in the table shows that there is a significant difference, as mentioned by the p-value. With the help of the Wilcoxon signed rank test it is evident

**Table 4**  
**Results of Hypotheses Testing**

Hypotheses	Items	Test	P value	Significance	Decision
<b>H01</b>	Identify risks	One-Sample Wilcoxon Signed Rank Test	0.000	Yes	Reject the null hypothesis
	Respond to risk	One-Sample Wilcoxon Signed Rank Test	0.000	Yes	Reject the null hypothesis
	Measure progress	One-Sample Wilcoxon Signed Rank Test	0.000	Yes	Reject the null hypothesis
	Find new opportunities	One-Sample Wilcoxon Signed Rank Test	0.001	Yes	Reject the null hypothesis
	Improve reputation	One-Sample Wilcoxon Signed Rank Test	0.002	Yes	Reject the null hypothesis
	Comply with regulations	One-Sample Wilcoxon Signed Rank Test	0.046	Yes	Reject the null hypothesis
<b>H02</b>	Risk management	One-Sample Wilcoxon Signed Rank Test	0.000	Yes	Reject the null hypothesis
	Regulatory compliance	One-Sample Wilcoxon Signed Rank Test	0.000	Yes	Reject the null hypothesis
	Measure progress	One-Sample Wilcoxon Signed Rank Test	0.000	Yes	Reject the null hypothesis
	Investor confidence	One-Sample Wilcoxon Signed Rank Test	0.000	Yes	Reject the null hypothesis
	Access to capital	One-Sample Wilcoxon Signed Rank Test	0.000	Yes	Reject the null hypothesis
	Stakeholder relationships	One-Sample Wilcoxon Signed Rank Test	0.014	Yes	Reject the null hypothesis
	Long-term value creation	One-Sample Wilcoxon Signed Rank Test	0.000	Yes	Reject the null hypothesis

*Source: Primary Survey.*

that the p-value is less than 0.05 for every single variable in H01 and H02 hypotheses. So the decision made by this test result is that the null hypotheses we have provided should

be rejected. And it shows a significant difference in the sustainability practices and the risk management framework within the National Pension Scheme investors

in Kerala as well as a significant difference in ESG consideration and resilience against Market, Regulatory and Reputational Risk for the National Pension Scheme investors in Kerala.

### Suggestion

1. The PFRDA can make compulsory ESG evaluation while selecting funds.
2. The PFRDA can integrate with the stock exchange to properly maintain the ESG database of companies that are listed on the stock exchange.
3. To manage long-term risks related to regulatory changes and demographic shifts, the investment companies can adopt ESG factors into investment strategies.
4. Stress-testing and scenario analysis should be introduced in companies for various sustainability and company policies.
5. Make transparency by disclosing all documents to beneficiaries by standardising ESG reporting.
6. Educate the National Pension Scheme subscribers about the sustainable

investment options as well as the ESG choices with long-term implications.

7. Promote collaboration between the National Pension Scheme regulators and other stakeholders to share risk perception and support policy changes.

### Conclusion

This study explores the role of sustainability in risk management within the National Pension Scheme and also examines ESG consideration to enhance the resilience against market, regulatory and reputational risk for the National Pension Scheme investors, based on the survey done in Thiruvananthapuram district with 75 respondents. National pension scheme investments should combine both sustainability and risk mitigation at all levels of their scheme. By doing this, they can protect the interests of investors and beneficiaries against the evolving risks like climate risk, market risk and social risk. The study concludes that the role of sustainability and risk mitigation in the National Pension Scheme can significantly influence the ESG consideration to enhance the resilience against market, regulatory and reputational risk.

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