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LIVELIHOOD VULNERABILITY INDEX APPROACH TO ASSESS THE IMPACT OF MGNREGS ON ASSET CREATION IN THE MADURAI DISTRICT OF TAMIL NADU

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ABSTRACT

Background:

The MGNREGA programme is an activity that attempts to elevate the rural economy through creation of sustainable assets. The Act seeks to create durable assets to augment land and water resource, improve rural connectivity and strengthen the livelihood resources base of the rural poor. Proper utilization of this scheme ensures short term benefits (Purchasing power improvement of weaker section of the society) and long term benefits (Mitigation of climate change) which are the crucial things to vulnerability reduction of rural poor everlastingly.

Objective:

The main focus of the present study is to analyse impact of MGNREGS on Asset creation in Madurai district of Tamil Nadu by applying Livelihood vulnerability Index method.

Materials and Methods:

The study was conducted in four blocks of Madurai district of Tamil Nadu in 2016-17. The sample respondents were from the two MGNREGS performance zones viz., High Work Blocks namely Madurai West, Melur block and Low Work Blocks (Sedapatti and Thiruparankundram).

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From each block 150 samples were selected totaling 600 respondents were selected by using Multistage random sampling technique. The Livelihood Vulnerability Index (LVI) approach was used to assess the impacts of MGNREG Scheme on Assets creation. This approach is based on the Sustainable Livelihood Framework (SLF) model used by Nguyen Duy Can et al., in 2013.

Results:

The study finds that among the High works blocks such as Melur and Madurai West ,Melur block has lower Livelihood Vulnerability Index such as 0.196 than Madurai West block such as 0.233. It reveals that the impact of MGNREG Scheme in Asset creation isfairly good. Regarding low works blocks namely Sedapatti and Thiruparngundram,Sedapatti block has higher Livelihood Vulnerability Index than Thiruparankundram block (0.52 vs 0.497), representing the impacts of MGNREG Scheme in asset creation is moderately good. It means that a high vulnerability score show in low work blocks of MGNREGS and low vulnerability score shows in high work blocks of MGNREGS. Itis alsorevealed thatLVI score within the low work blocks and high work blocks are not varying much. There is a meager variation. But the LVI index score between the LWB's and HWB's are varying significantly.

Conclusion:

The study finds that the low work blocks of MGNREGS are suffered from huge livelihood vulnerability. It leads to furtherwidened imbalanced distribution and growth. Hence the government should make more efforts to complete maximum beneficiaries of 100 days employment in MGNREGS from low work blocks. To conclude that proper and optimum utilization of the MGNREG Scheme would ultimately facilitate to create the social, cultural, economical and environmental assets of rural area.And therby sustainable growth of rural economy.

Keywords and JEL Codes: Employment (E24), Capital (D24), Index Number (C43), Sustainable Development (Q01).

1. Introduction:

MGNREGA is one of the most significant interventions of the government in post independent India. Aiming at addressing the principal causes of hunger and starvation in rural areas the Act ensures the poor that they can expect to earn a living wage, without loss of their dignity and demand work as their right. In addition to the immediate impact in terms of poverty reduction, the programme has the potential to lead the economy in labour intensive growth path through the creation of assets. (Yean-Yves Gerlitz et al. 2016). The MNREGA activities were found to reduce the vulnerability of agricultural production, water resources and livelihood to uncertain and rainfall, water scarcity and poor soil fertility. There is a huge potential for using the MNREGA programme as an approach to reduce the vulnerability of production systems and livelihoods in the short and long term especially against the background of creating climate variability and climate change. Most activities that reduce vulnerability to current stress such as moisture stress or low soil fertility also has the potential to reduce vulnerability to the long term effects of climate change.

The Act seeks to create durable assets to augment land and water resource, improve rural connectivity and strengthen the livelihood resources base of the rural poor. MGNREGS works largely focused on land and water resources, which include water harvesting and conservation, soil conservation and protection, irrigation provisioning and improvement, renovation of traditional water bodies, land development and drought proofing (Giz, 2013).MGNREGA is recognized as an ecological Act that aims to create sustainable livelihoods through regeneration of the natural resource base of rural India. In the process, it provides resilience and adaptation to climate change. Evidence of the suitability of the MGNREGA works in terms of their usefulness for environment and ecology is emerging. In the short run, environmental services have an impact at the local level on natural resources, water availability etc. At the large scale, they may have regional implication for climate change mitigation and Carbon sequestration as well.Creation of sustainable assets that strengthen the livelihood resource base of small areas is one of the key objectives of MGNREGA. MGNREGA works have the potential to benefit rural communities by improving irrigation facilities, enhancing land productivity and connecting remote villages to input and output markets. (MGNREGA,Sameeksha 2012).Apart from the

primary objective of enhancing the livelihood security of the rural households, by providing on demand up to 100 days of guaranteed wage employment to every rural household for doing unskilled manual work, creation of durable assets is also an important objective of MGNREGA. The choice of works suggested in the Act addresses causes of chronic poverty like drought, deforestration, soil erosion, water availability etc. So that the process of employment generations maintained on a sustainable basis and durable assets are created in rural areas by strengthening the natural resources base.

Under MGNREGA, there is a great scope for building social capital on a massive scale. Indeed MGNREGA gives an ample opportunity to reverse the prolonged neglect of productive and durable rural infrastructure. The Community assets created under MGNREGA has both direct and indirect benefits to the villages. The list of the assets to be undertaken under the scheme is expected to enhance the livelihood opportunities in the main stream economy in agriculture and allied activities, protect and regenerate environmental resources and improve infrastructure as well as quality of life of people (Prasanna.V.Salian and Leelavathi.D.S, 2014).NREGA is considered as one of the most powerful initiatives ever undertaken to transform rural livelihood in India. It is a developmental Programme undertaken in public investments for creation of durable or sustainable assets, which can provide much needed momentum to growth in the most backward regions of India. The Act aims at construction of bunds and ponds as part of the watershed development strategy. In this foundation of water security, a sustainable development plan can be built that included a healthy agriculture and allied rural livelihood. The NREGA programme is an activity that attempts to elevate the rural economy through creation of sustainable assets. It aims at facilitating the use of ecology for economy. The first aspect of the Act that could be relooked at as its evaluation and monitoring. Instead of the simple calculation on jobs demanded and provided the NREGA need to be evaluated and monitored on its impact on livelihood security through sustainable asset creation. Nanditadebnath and Debases Neogi,2013).

MGNREG Scheme created assets in the rural area through various works including Rural Connectivity, Flood Control and Protection, Water Conservation and Water Harvesting, Drought Proofing, Micro Irrigation Works, Provision of Irrigation facility to Land Owned by SC / ST, Renovation of Traditional Water bodies, Land Development, Any Other activity Approved by

MRD, Rajiv Gandhi Seva Kendra and Rural Sanitation. Proper utilization of this scheme ensures short term benefits (Purchasing power improvement) and long term benefits (mitigation of climate change).

2. Objectives of the Study

The main focus of the present study is to analysethe impact of MGNREGS on Asset creation in Madurai district of Tamil Nadu by applying Livelihood vulnerability Index method.

3. Method and Materials

When constructing the livelihood Vulnerability index to assess the impacts of MGNREGS on asset creation in the study area, the following background studies are carefully reviewed.

Pamod Singh and Abhishek Nair (2014) estimated livelihood vulnerability index to climate variability and change of poor agro-pastoralists in nine villages of Bhilwara district of Rajasthan. The study used Fuzzy Cognitive Mapping (FCM) approach to capture people's perceptions of climate induced perturbations and adaptations. The study revealed that livelihood vulnerability of agro-pastoralists lie in the range of being 'vulnerable' to climate variability and change while varying across three seasons summer, winter and rainfall. Further, it inferred that financial and natural assets are most susceptible to harm while organizational and financial assets provide resilience against climate variability and change. Nguyen Duy Can et al., (2013) applied the Sustainable Livelihood Framework (SLF) to assess risks from flood vulnerability and climate variability in PhuHuu and Ta Danhvillages of Vietnam. The study surveyed 120 households in each village with pretested interview schedule which consist of ten major components of LVI namely socio-demographics, livelihoods, health, social networks, physical and finance, natural resources, natural disasters and climate variability. The study finds that overall LVI of PhuHuu village is 0.488 which makes PhuHuu's livelihoods moderately vulnerable to flooding and climate variability. This value is higher than the overall LVI of 0.432 of Ta Danh village. Jean-Yves Gerlitz et al., (2016) made a study on Multidimensional Livelihood Vulnerability Index (MLVI) to measure livelihood vulnerability to change in 16 surveyed districts in Hindu Kush Himalayas in 2011-2012. The survey used Vulnerability and Adaptive Capacity Assessment(VACA) questionnaire and it covers 12 components of vulnerability index of viz., the

hermetic areas of household consumption, food security, water security, health and healthcare, access to basic facilities, accessibility, housing, education, assts, gender inequality, and exposure and resilience to shocks and medium term climatic and environmental changes. Among the 16 surveyed districts, Lohit and Udayapur showed the highest absolute contributor of lack of adaptive capacity to livelihood vulnerability (0.16 and 0.17 respectively). Prince M.Etwire et al. (2013) estimates the level of vulnerability of small holder farmers to climate change and variability in the three regions of India namely, northern, upper East and Upper West northern by using the livelihood vulnerability. This study uses the livelihood vulnerability Index (LVI) developed by Hahn et al (2009). The major results of the study are that the vulnerability indices of the major components ranged from 0.17 – 0.58. Index for the water component of the LVI shows upper West region to be the most (0.489) vulnerable and the northern region to be the lean (0.371) vulnerable. In terms of socio demographic profile of vulnerability the index for northern region is 0.326, the most vulnerable followed by the upper Eastern Region, 0.307). Regarding health component of vulnerability index northern Region is found to be most vulnerable i.e 0.259. The findings of the study have important policy relevance that could enable small holder farmers in northern Ghana to better to the effects of climate change and variability. Christina Papadaskalopoulou et al., (2017) made an assessment of the vulnerability of Cyprus to climate change and to develop a national strategy for addressing the identified vulnerability and increasing the resilience of the country. Multi Criteria Analysis (MCA) tool used to identify the level of vulnerability. Over all 52 vulnerability of the different policy area of Cyprus to climate change were indentified while over 270 relative adaptation measures were evaluated with the Multi Criteria Analysis. The quantitative equation to explain the relationship with terms and Vulnerability = Impact – Adaptive Capacity where Impact = Sensitivity * Exposure. The priority of adaptation measure are water resource, soil resources, Bio diversity, agriculture, forests, public health, energy demand for cooling, health and tourism.

There are several methods for evaluating the level of vulnerability, each one having some or other limitation. Having understood various methods of indexing, availability of types of data and keeping in view the limitation of the various methods, the following procedure for estimation of composite indexis followed in this study.

3.1. Construction of LVI

The study aimed to analyse the level of vulnerability under impacts of MGNERGS in Low Works Area (Sedapatti&Thiruparankundram Blocks) and High Works Area (Madurai West and Melur Blocks). The study is based on the Sustainable Livelihood Framework (SLF) assessed byNguyen Duy Can et al., (2013). Indicators and sub–components, of community vulnerability to MGNERGS impacts are grouped into eight major components presented in Table 1. These components, classified under 5 different livelihood capitals in the SLF: social, human, financial, physical and environmental comprise of social vulnerability, human vulnerability, financial vulnerability, employment vulnerability, agriculture vulnerability and environmental vulnerability. Each major component includes several indicators or sub-components developed based on available data collected through household surveys on impacts of MGNREGS in sample areas.

3.2.Calculating the LVI

In this study the LVI was calculated by applying a balanced weighted average approach**.** A simple method with equal weights was applied for all major components. Because each sub-components is measured on a specific scale, it was therefore normalized as an Index. For this purpose the following equation is used to calculate LVI.

$$\text{index}_{sb} = \frac{S_b - S_{min}}{S_{max} - S_{min}} \qquad (1)$$

Where, S_b is the value of sub-component for block b: S_{min} and S_{max} are the minimum and maximum values respectively, from data of that sub-component in both blocks. After normalizing sub-component values, the value of each major component was calculated by eq. (2):

$$M_{vj} = \frac{\sum_{i=1}^{n} \text{index}_{sbi}}{n} \qquad (2)$$

Where, M_{VJ} is value of major components j for block b; index_{sbi} represents the value of sub-components indexed by I of major component $M_j$and n is the number of sub-components in major component M_j. These eight component values were directly used in eq. (3) or aggregated to five values for livelihood capitals [S- Social capital, H-Human capital, F- Financial capital, P-

Physical capital and E – Environmental capital] before used in Eq.(4) to obtain the weighted average of LVI:

$$LVI_b = \frac{\sum_{j-1}^{8} W_{mj} M_{bj}}{\sum_{j=1}^{8} W_{mj}} \quad (3)$$

$$LVI_b = \frac{w_S S_b + w_H H_b + wF_b + w_P P_b + w_E E_b}{w_S + w_H + w_F + w_P + w_E} \quad (4)$$

Where, LVI $_b$ is the livelihood vulnerability index of block b; w_{mj} is weight value of major component j, w_S, w_H, w_F, w_P, $w_E$are weight value of social, human, financial, physical and environmental capital respectively.

In simple, LVI is calculated by summing the score of capital and divided by total number of capital used.

$$\mathbf{LVI} = \frac{\mathbf{SocailCapital + HumanCapital + FinancialCapital + PhysicalCapital + EnviraionmenalCapital}}{\mathbf{5}} \quad \mathbf{(5)}$$

The LVI value is ranged from 0 to +1; 0 representing no vulnerable and 1 representing most vulnerable.

Spider Chart / Radar Chart

A Radar Chart/ Spider Chart is a graphical method of displaying multivariate data in the form of a two-dimensional chart of three or more quantitative variables represented on axes starting from the same point. It is a frequently used method for comprehensive evaluation, particularly useful for holistic and overall assessment through multivariate data. Generally when there are a large number of variables, the Column Chart might look cluttered. In such scenarios Radar Chart is more apt method. In this study, Radar chart is more suitable than column chart because the study used multivariate data set to assess the impacts of MGNREGS in Asset creation in High Work Block and Low Work Blocks. Eight major components scores of vulnerability and 5 capital score of vulnerability are graphically explained by using Spider chart.

Table 1: Capital, major components and sub-components comprising the livelihood vulnerability index.

Capital	Major Components	Sub-Components/ Indicators	Vulnerability score
Social Capital	Social vulnerability	% of female nonparticipation in Gram Sabha	The higher the female nonparticipation in Gram Sabha the higher the vulnerability.
		% of female nonparticipation in gram panchayat	The higher the female nonparticipation in Gram Panchayat the higher the vulnerability.
		% of female nonparticipation in religious group	The higher the female nonparticipation in religious group the higher the vulnerability.
		% of female nonparticipation in farmer organization	The higher the female nonparticipation in farmer organization the higher the vulnerability
		% of female non participation in worker organizaiton	The higher the female nonparticipation in worker organization the higher the vulnerability
		% of female nonparticipation in civil society organization	The higher the female nonparticipation in civil society organization the higher the vulnerability
		% of female nonparticipation in NGO's	The higher the female nonparticipation in NGO's the higher the vulnerability
		% of female nonparticipation in SHG's	The higher the female nonparticipation in SHG's the higher the vulnerability
Human Capital	Human Vulnerability	% of the household size	The higher the household size, the higher the vulnerability
		% of the education level	The lower the education skill higher the vulnerability
		% of the age distribution	The higher the age group (senior Citizen), the

			higher the vulnerability
Financial Capital	Financial Vulnerability	% change of household income	The lower the household income higher the vulnerability
		% change of household indebtedness	The higher the household indebtedness higher the vulnerability
		% change of monetary debt	The higher the monetary debt higher the vulnerability
		% change of household saving	The lower the household saving higher the vulnerability
		% change of borrowing from relatives	The higher the borrowing from relatives higher the vulnerability
		% change of consumption pattern	The lower the consumption pattern higher the vulnerability
		% change of market wages	The lower the market wages higher the vulnerability
	Employment Vulnerability	% change of unpaid family work	The higher the unpaid family work higher the vulnerability
		% change of unemployment	The higher the unemployment higher the vulnerability
		% change of leisure time	The lower the leisure time higher the vulnerability
		% change of migration	The higher the migration higher the vulnerability
Physical Capital	Agricultural Vulnerability	% change of agricultural productivity	The lower the agricultural productivity higher the vulnerability
		% change of cropping intensity	The lower the cropping intensity higher the vulnerability
		% change of crop loss	The higher crop loss higher the vulnerability
		% change of crop disease	The higher crop disease higher the vulnerability

		% change of cropping pattern	The lower the cropping pattern higher the vulnerability
		% change of purchase of livestock	The lower the purchase of livestock higher the vulnerability
Environmental Capital	Natural Resources	% change of the natural capital	The lower the natural capital higher the vulnerability
		% change of durable assets created	The lower the durable assets created higher the vulnerability
		% of rate of quality of assets generated	The lower the rate of quality of assets generated higher the vulnerability
	Water Resources	% change of water conservation	The lower the water conservation higher the vulnerability
		% change of water table	The lower the water table higher the vulnerability
		% change of drying of bore well	The higher drying of bore well higher the vulnerability
		% change of drying of open well	The higher drying of open well higher the vulnerability
		% change of non usage of public taps	The higher the use non-usage of public taps higher the vulnerability
		% change of water borne disease	The higher the water borne disease higher the vulnerability
	Land Resources	% change of soil conservation	The lower the soil conservation higher the vulnerability
		% change of afforestation	The lower the afforestration higher the vulnerability

Table 1 explains that vulnerability capital, major components and sub-components comprising the livelihood vulnerability index. Table 1 consists of four columns. Five vulnerability capitals include Social Capiatl, Human Capital, Financial Capital, Physical Capital and Environmental Capital which are shown in column 1. Eight major components of vulnerability Index such as

Social Vulnerability, Human Vulnerability, Financial Vulnerability, Employment Vulnerability, Agricultural Vulnerability, Natural Resources, Water Resources and Land Resources are shown in Column 2. Sub components/ Indicators of Vulnerability Index are given in Column 3. Sub components values are based on the percentage value. These values are derived from the primary data. Vulnerability scores are shown in Column 4. It helps to calculate the Livelihood Vulnerability Index. Higher and lower vulnerability scores are obtained based on the impact of MGNREGS .on socio-economic and environmental indicators from the lower and Higher works Blocks of the Study Area .

3.3. Household Survey and Secondary Information

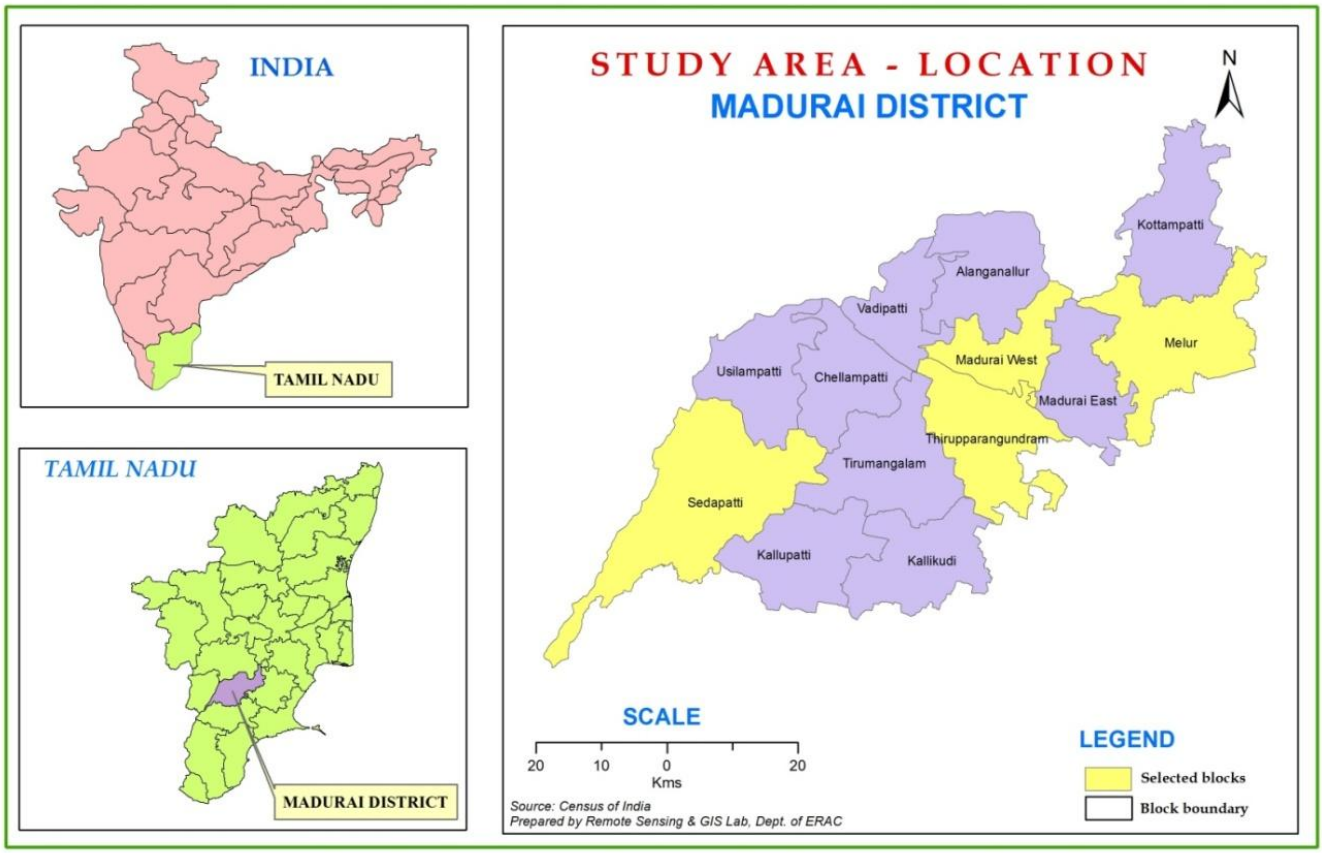
Both primary and secondary data were collected for this study. Multistage random sampling technique was used to select the sample. In the first stage, Madurai district is purposively selected. In the second stage, Out of 13 blocks of Madurai district, four blocks namely, Madurai West and Melur, Sedapatti and Thiruparankundram selected purposively. These four blocks are situated in different zones. First two blocks viz., Madurai West and Melur block are selected due to high level work performed in MGNREGS and remaining two blocks (Sedapatti and Thiruparankundram) are selected due to low level work performed in MGNREGS. In the third stage, from each block 3 villages which had undertaken more works and 3 villages which had undertaken less works were selected, totaling 12 sample villages. In the final stage, from each village 50 households which are participation in MGNREG Scheme were selected randomly, so that total of 600 sample respondents were selected to study the impacts of MGNREGS on Asset creation in Madurai district of Tamil Nadu in 2016-17.The study had used pretested interview schedules to collect the data. The main focus of the interview schedule and question related to MGNREGS impacts on different assets of the sample blocks namely, Social Capital, Human Capital, Financial Capital, Physical Capital and Environmental Capital. The collected data were tabulated and analysed by using SPSS software. Vulnerability Spider Chart was drawn by using Microsoft office Excel.

3.4. Profile of the Study Area

Madurai district comprises of 13 revenue blocks. Under the gram panchayat rural administration system, the district had 526 rural inhabited villages and had a density of 587.54 per sq.km. ranging from the lowest of 203 persons in Sedapatti to at the highest of 1702 persons in Madurai

West. Madurai West has an area of 3751.43 Sq.Km. As of 2011 census, the Madurai district under 13 blocks had a rural population of 11,91,451 constituting 6,01,247 males and 5,90,204 females. It had a sex ratio of 982 females for every 1000 males with respect to 13 blocks. Scheduled Caste and Scheduled Tribes accounted for 2,57,852 and 4,866 of the total rural population. According to 2011 census, Madurai District had a total workers of 13,54,632 out of 30,38,252. The remaining 16,83,620 are non-workers. Out of total workers, 9,02,704 are male workers and 4,51,928 are females workers, 81,352 cultivators, 2,87,731 agricultural labours, 39,753 Household industry workers, 7,65,066 other workers and 1,84,027 are marginal workers.

Fig.1. Location of the study area in Madurai District of Tamil Nadu.



Result and Discussion

4.1. Livelihood Vulnerability Index of low level works blocks (LWB's)

LVI values of all 39 sub-components, 8 major components and 5 capitals are presented in Table 2. The Overall LVI of Sedapatti block is 0.52. It shows that vulnerability level is moderate in Sedapatti block. This value is higher than the overall LVI of 0.497 in Thiruparankundram block. In the following section, vulnerability assessments for all 5 capitals and respective major components are discussed in details.

4.1.1. Social Capital Vulnerability

Female nonparticipation in gram sabha, religious group, farmer organization, NGO's and SHG's are more in Sedapatti block compared to Thiruparankundram block. But the Female nonparticipation in the other variables such as in gram panchayat and civil society organization inThiruparankundram block are high compared to Sedapatti block.These variables have an impact on overall social Vulnerability of these two blocks such as 0.53 in Sedapatti and 0.51 in Thiruparankundram. Comparing this two blocks, social vulnerability of Sedapattiblock is more compared to Thiruparankundram block. Vulnerability factors such as illiteracy and lack of awareness, male domination, and lack of own interests inattending social functionsare the main reasons to poor and irregular participation of women in various village level organizations. Apart from that, household agriculture work, journey, health problems of other members in the family etc. are related obstacles to participate women in the village level organization.

The study identified the following factors which affect the regular participation in MGNREGS works, even though they are willing to work in MGNREGS viz., too late payments, health problems, domestic work load, own agricultural works, high market wages, irregular wage payments, gender and caste inequity, worksite nuisance (caste dissemination, sexual harassment)carelessness of officials, barriers in receiving employment and wage, officials unable to offer employment, lack of required worksite amenities, hard work and distance to worksite etc.

4.1.2. Human Capital Vulnerability

All the Sub components of human vulnerability index such as size of household (more than 4 persons in a family), number of illiterate and primary education holders, mass participation of old age group in MGNREGS are higher in Sedapatti block than

Thiruparankundram block. Human vulnerability score of Sedapatti block and Thiruparankundram block are 0.427 and 0.338 respectively.

4.1.3. Financial Capital Vulnerability

The financial capital vulnerability of Sedapatti block (0.407) is higher than that of Thiruparankunram block (0.395). The details indicated that the higher employment vulnerability of Sedapatti block is mainly from these sub-components: percentage change of migration and percentage change of unemployment.Financial vulnerability of Thiruparankunram block (0.384) is higher than that of Sedapatti block (0.369), because of higher percentage of household indebtedness and borrowing from relatives and friends, market wages and unpaid family work. It reveals that impact of MNREGS on the above financial sub components are small on asset creation as compared to Sedapatti block. However, some sub components of financial vulnerability of Sedaptti block are higher than Thiruparankundram block such as household savings, monetary debt, household savings, and consumption pattern.

A significant number of respondents consented that MNREGA has successfully reduced the distress migration. Respondents agreed that small and medium indebtedness to informal sources are also checked after the NREGA had been implemented. Moreover, MNREGA provided employment to the women at higher wage rate as compared to prevailing wage rate for unskilled labour work within the village. The result shows that optimum utilization of MGNREGS is positively associated with improvement of household income and expenditure, consumption pattern, household saving, market wages and credit repayments. Simultaneously, unpaid family work, leisure time, unemployment, mass rural migration, borrowing from relatives and friends, monetary debts and household indebtedness variations are negatively associated with optimum utilization of MGNREGS.

4.1.4. Physical Capital Vulnerability

The Physical capital components are vulnerability percentage of cropping pattern in Sedapattiblock (0.80) Shows a higher percentage than Thiruparankundram block (0.62). Vulnerability percentage of cropping intensity in Sedapatti block is higher than

Thiruparankundram block. But other components such as percentage vulnerability level of percentage of agricultural productivity and purchase of livestock are higher in Thiruparankundram than Sedapattiblock. Percentage of crop loss during post MGNREGS implementation period is slightly higher in Thiruparankundram block andSedapatti block.

Water resources development works in rural regions especially the de-silting of tanks and ponds and the construction of a number of percolation tanks are constructed under MGNREGS to collect and store rainwater, thus improving the underground water table and facilitating crop cultivation. The enhanced water supply has brought the farmers back to agriculture. It reveals that improved micro and small irrigation works under MGNREGS helps to increase in area cultivated and crop diversification resulting in more employment and reduced migration.

4.1.5. Environmental Capital Vulnerability

Environmental capital vulnerability comprised of three major components such as natural resources vulnerability, water resources vulnerability and land resources vulnerability. Environmental capital vulnerability of Sedapatti block is 0.562. This value is higher than the Environmental capital vulnerability of 0.55 in Thiruparankundram block. Higher Environmental capital vulnerability in Sedapatti block is due to higher vulnerability percentage of natural resources and water resources about (0.427) and (0.652) respectively, however vulnerability percentage of land resources is slightly lower in Sedapatti block (0.493) than Thiruparankundram block (0.497). Sub-components of environmental capital vulnerability includes natural capital, quality of asset created, water conservation, drying of bore well, non use of public taps, water borne diseases, afforestation are higher in Sedapatti block than Thiruparankundram block. However, due to poor impacts of MGNRES in durable assets created, water table variation, afforestaration, soil fertility and open well condition wise the environment capital vulnerability of Thiruparankundram is higher than Sedapatti block.

Table 2: LVI of all sub-component values, major components and capitals for Sedapatti (SP) and Thiruparankundram (TK) Blocks

Sub-Components	SP	TK	Major Components	SP	TK	Capital	SP	TK
% of female nonparticipation in Gram Sabha	0.653	0.593						
% of female nonparticipation in gram panchayat	0.533	0.56						
% of female nonparticipation in religious group	0.420	0.347						
% of female nonparticipation in farmer organization	0.447	0.393	Social Vulnerability	0.53	0.51	Social	0.53	0.51
% of female nonparticipation in worker organizaiton	0.593	0.533						
% of female nonparticipation in civil society organization	0.553	0.64						
% of female nonparticipation in NGO's	0.62	0.607						
% of female nonparticipation in SHG's	0.407	0.367						
% of the household size	0.153	0.107						
% of the education level	0.747	0.600	Human Vulnerability	0.427	0.338	Human	0.427	0.338
% of the age distribution	0.380	0.307						
% change of household income	0.293	0.273						
% change of household indebtedness	0.347	0.507						
% change of monetary debt	0.567	0.373						
% change of household saving	0.540	0.527	Financial Vulnerability	0.369	0.384	Financial	0.407	0.395
% change of borrowing from relatives	0.193	0.207						
% change of consumption pattern	0.380	0.340						
% change of market wages	0.260	0.460						
% change of unpaid family work	0.253	0.340	Employment	0.475	0.415			
% change of unemployment	0.700	0.60	Vulnerabili					

		7	ty					
% change of leisure time	0.473	0.500						
% change of migration	0.473	0.213						
% change of agricultural productivity	0.667	0.707						
% change of cropping intensity	0.760	0.647						
% change of crop loss	0.553	0.600	Agricultural Vulnerability	0.683	0.655	Physical	0.683	0.655
% change of crop disease	0.760	0.727						
% change of cropping pattern	0.800	0.620						
% change of purchase of livestock	0.560	0.627						
% change of the natural capital	0.500	0.480	Environmental Vulnerability	Natural Resources	0.427	0.420		
% change of durable assets created	0.353	0.413						
% of rate of quality of assets generated	0.427	0.367						
% change of water conservation	0.660	0.633		Water Resources	0.652	0.633	Environmental	0.562	0.550
% change of water table	0.593	0.707						
% change of drying of bore well	0.647	0.613						
% change of drying of open well	0.560	0.567						
% change of non-usage of public taps	0.727	0.673						
% change of water borne disease	0.727	0.607						
% change of soil conservation	0.353	0.407		Land Resources	0.493	0.497		
% change of afforestation	0.633	0.587						
Overall LVI (Weighted average of social, human, financial, physical and Environmental capital)							0.520	0.497

Source: Computed from primary data

Fig. 2: Application of Livelihood Vulnerability Index to Assess Impact of MGNREGS on Asset creation in Sedapatti and Thiruparankundram blocks

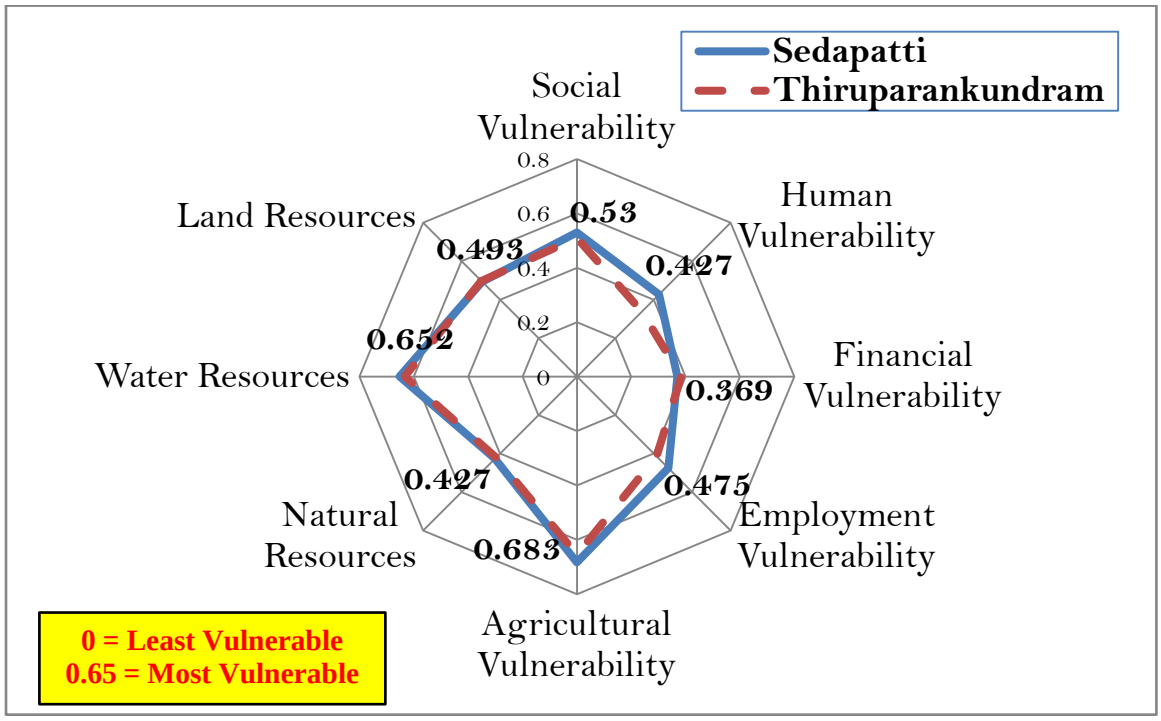
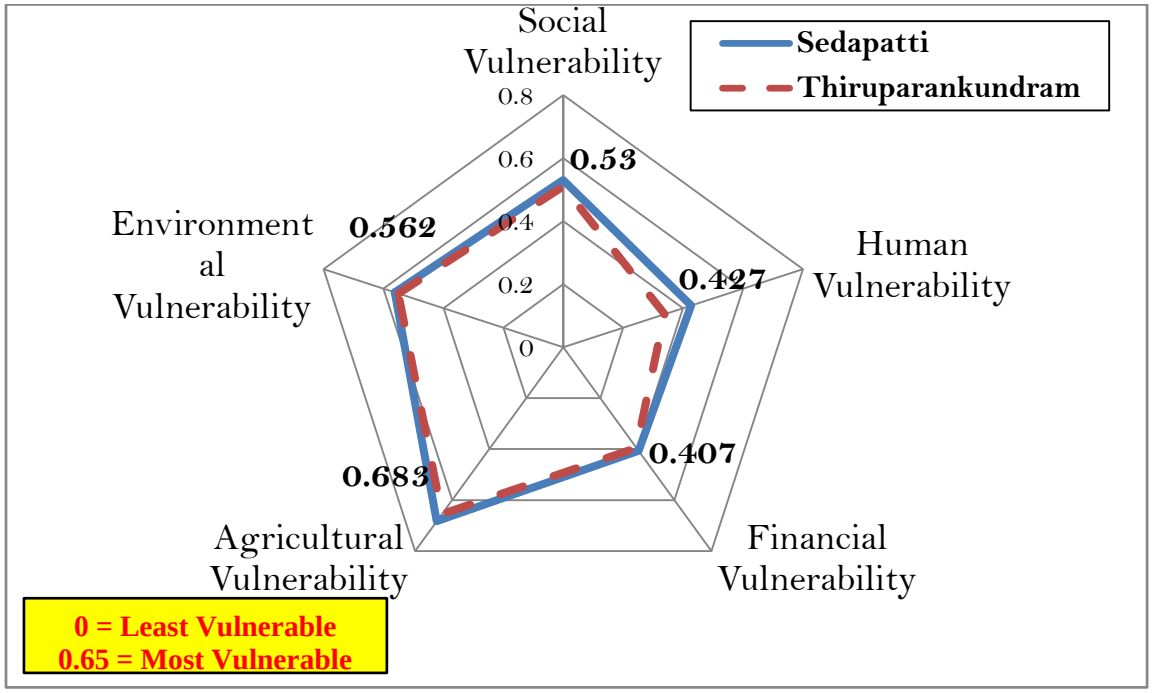


Fig. 3: Vulnerability diagram of major components of Sedapatti and Thiruparankundram block



Overall, Sedapatti block has higher Livelihood Vulnerability Index than Thiruparankundram block (0.52vs 0.497), representing the impacts of MGNREG Scheme in Asset creation is moderately good. The results of eight major components are showed mutually in a spider diagram (fig.2) with scale in 0.1 unit increments, from 0 (less vulnerable) at the center of the web to 0.7 (most vulnerable) at the outside edge. The diagram clearly explains that Sedapatti block is high vulnerable in most components including social,human, employment, agricultural, natural resources and water resources. However, Thiruparankundram block is slightly higher in financial and land resources. Fig.3 shows that all the five capitals vulnerabilities namely social, human, financial,Agricultural, and environmental are higher in Sedapattiblock than Thiruparankundram block. These results indicate particularly which capitals should be taken into account for reducing livelihood of these blocks.

4.2. Livelihood Vulnerability Index of High level works blocks (HWB's)

LVI values of all 39 Sub components, 8 major components and 5 capitals are presented in Table 3. The Overall LVI of Melur block is 0.196. This value is lower than the Overall LVI of 0.233 in Melur Block. In the following section, vulnerability assessments for all 5 capitals and respective major components are discussed in details.

4.2.1. Social Capital vulnerability

The low social capital vulnerability score revealed that the impacts of MGNREGS in social organizations nonparticipation of marginalized group are considerably very low and showed high social development. The high social capital vulnerability score is revealed that the low impact of MGNREGS in various society organization nonparticipation of marginalized group includes SC, ST and women.

The social capital vulnerability of Melur Block (0.14) is lower than that of Madurai West block (0.15) due to its lower non participation offemale in civil society organization, worker organization, farmer organization and Gram Sabha. However, the female nonparticipation in gram Panchayat, religious group in Madurai west block is slightly lower than the Melur Block. Both in Madurai west block and Melur block, the female nonparticipation in SHG/s shows equal value (0.073). Because of higher the female participation in SHG's, they were well aware about

the benefits of the participation in various social relation programmes such as gram Sabha, civil society organization, farmer organization, workers organization etc. it is further stimulated post MGNREGS implementation period. The MGNREGS beneficiaries frequently attended meetings in Panchayat office onMGNREGS worksite selection and other related works. This helps to the rural people especially, women to directly approach the Panchayat Office bearers (Panchayat president, Clerk) without hesitation for their village related personal queries. The women respondents reported that central sponsored scheme such as National Social Assistance programmes, PradhanMantriAwasYojna (PMAY), PradhanMantriKrishiSinchaiYojana, Swachh Bharat Mission (SBM), National Livelihood Mission – Ajeevika, etc. During Pre MGNREGS implementation period, women used to approach their male household head (husband) to access information related to village development schemes, at the same time they have hesitate to meet and ask personal and village related queries in front of Panchayatoffice bearers.The entire situations had changed during post MGNREGS implementation in rural areas.

4.2.2. Human Capital Vulnerability

The Human Capital index of Melur Block (0.331) is lower than that of Madurai West Block (0.364), due to its lower percentage of age distribution. Household sizes more than 4 and number of illiterate and primary education holders are low in Madurai West than Melur block. However, the senior citizen participation (Age above 60 years) is low in Melur Block than Madurai west block. Senior citizen preferred to work in MGNRGES The main reasonsare non-availability of job, work adjustment accompany by the MNREGS participants like Digging land, carrying heavy load, etc.

4.2.3. Financial Capital Vulnerability

The low financial capital vulnerability score revealed that the impacts of MGNREGS in employment and financial sources improvement and showed high financial development of the household. The high financial vulnerability score is revealed that the low impact of MGNREGS in employment and finance of the family.

Financial vulnerability sub components are household income , monetary debt, household savings, borrowing from relatives, market wages, unpaid family work , unemployment rate,

leisure time are lower in Melur block. However the other financial vulnerability variables such as household indebtedness, consumption pattern, and migration are lower in Madurai West block than Melur block. Major components of financial vulnerability and employment vulnerability are lower in Melurblock, it accounts 0.181 and 0.225 respectively. Financial vulnerability and employment vulnerability of Madurai West block are 0.248 and 0.29 respectively. It reveals that financial vulnerability score between the two blocks are high as compared to employment vulnerability scores.

4.2.4. Physical Capital Vulnerability

The low physical capital vulnerability score revealed that the positive impacts inagriculture during post MGNREGS implementation. The high physical vulnerability score is revealed that the low impact of MGNREGS onagriculture activates namely, cropping pattern, cropping intensity, livestock development agricultural productivity and safeguard from agricultural risks (Crop loss, crop disease etc.)

The survey result shows that vulnerability level of agricultural productivity, cropping intensity, crop loss, crop disease are lower in Melur block than Madurai west block. The combination of these sub components provides a lower agricultural vulnerability index of Melur block. The respondents reported that crop loss and crop disease had reduced in post MGNREGS implementation period as compared to pre MGNREGS period. Other sub-components of agricultural vulnerability viz., purchase of livestock and cropping pattern are lower in Madurai West block.Physical capital (Agricultural) vulnerability of Melur block is 0.183 it is lower than that of Madurai West block (0.203).

4.2.5. Environmental Capital Vulnerability

Environmental capitalvulnerablity comprised of three major components such as vulnerable natural resources, vulnerable water resources and vulnerable land resources. Environmental capital vulnerability of Melur block is 0.207. This value is lower than the environmental capitalvulnerability of 0.236 in Madurai West block. The lower environmental capital vulnerability in Madurai west block is due to all the three major low vulnerability components such as natural resource, water resources and land resource. They accounted 0.18, 0.206 and 0.25

respectively. Except few sub components of environmental capital vulnerability such as natural capital, water conservation, usages of public taps and soil conservation, all other sub components are lower in Melur block. The MGNREGS is positively increasing the natural capital, quality of durable assets, water connection, water table, soil conservation and afforestration. It has helped to reduce water born disease, drying of bore well and open well and non usage of public taps. It reveals that MGNREGS helps the development of land resources, water resource and natural resources and leads to prolonged livelihood security to rural people.

Table 3: LVI of all sub-component values, major components and capitals for Madurai West (MW) and Melur (ML) Blocks

Sub-Components	MW	ML	Major Components	MW	ML	Capital	MW	ML
% of female nonparticipation in Gram Sabha	0.160	0.053	Social Vulnerability	0.150	0.140	Social	0.15	0.140
% of female nonparticipation in gram panchayat	0.093	0.153						
% of female nonparticipation in religious group	0.100	0.133						
% of female nonparticipation in farmer organization	0.167	0.087						
% of female nonparticipation in worker organizaiton	0.167	0.140						
% of female nonparticipation in civil society organization	0.207	0.107						
% of female nonparticipation in NGO's	0.233	0.373						
% of female nonparticipation in SHG's	0.073	0.073						
% of the household size	0.10	0.107	Human Vulnerability	0.364	0.331	Human	0.364	0.331
% of the education level	0.653	0.66						
% of the age distribution	0.34	0.227						
% change of household income	0.307	0.12	Financial Vulnerabili	0.248	0.181	Financial	0.263	0.197
% change of household	0.1	0.12						

indebtedness			ty					
% change of monetary debt	0.287	0.253						
% change of household saving	0.173	0.153						
% change of borrowing from relatives	0.18	0.013						
% change of consumption pattern	0.133	0.193						
% change of market wages	0.553	0.413						
% change of unpaid family work	0.427	0.353						
% change of unemployment	0.267	0.093	Employment Vulnerability	0.290	0.225			
% change of leisure time	0.187	0.093						
% change of migration	0.280	0.36						
% change of agricultural productivity	0.14	0.027						
% change of cropping intensity	0.22	0.213						
% change of crop loss	0.287	0.147	Agricultural Vulnerability	0.203	0.183	Physical	0.203	0.183
% change of crop disease	0.347	0.193						
% change of cropping pattern	0.133	0.173						
% change of purchase of livestock	0.093	0.347						
% change of the natural capital	0.053	0.187	Natural Resources	0.2	0.18			
% change of durable assets created	0.38	0.28						
% of rate of quality of assets generated	0.167	0.073						
% change of water conservation	0.137	0.187				Environmental	0.236	0.207
% change of water table	0.22	0.1						
% change of drying of bore well	0.367	0.24	Water Resources	0.239	0.206			
% change of drying of open well	0.22	0.193						
% change of non usage of public taps	0.207	0.28						

Environmental Vulnerability

% change of water borne disease	0.28	0.233			
% change of soil conservation	0.02	0.233	Land Resources	0.284	0.25
% change of afforestation	0.547	0.267			
Overall LVI (Weighted average of social, human, financial, physical and Environmental capital)				0.233	0.196

Source: Computed from primary data

Fig. 4: Application of Livelihood Vulnerability Index to Assess Impact of MGNREGS on Asset creation in Madurai West and Melur blocks

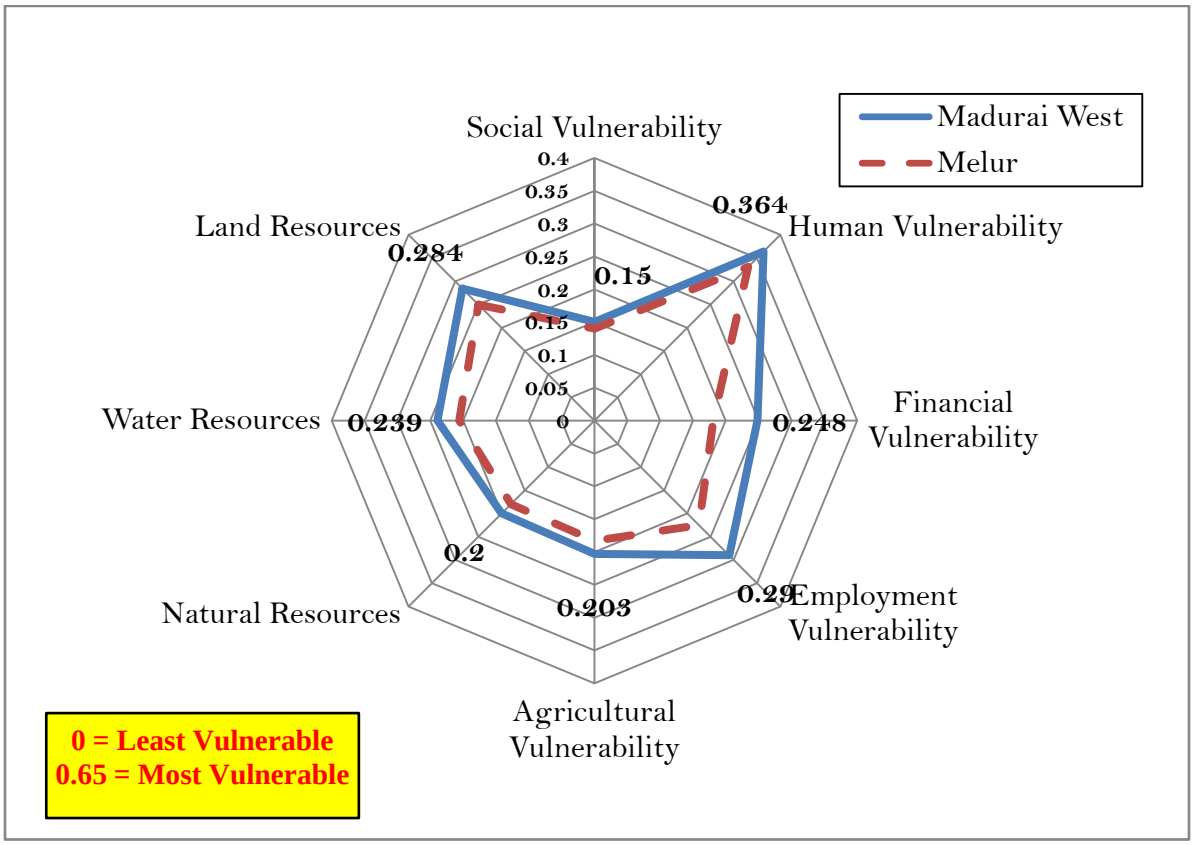
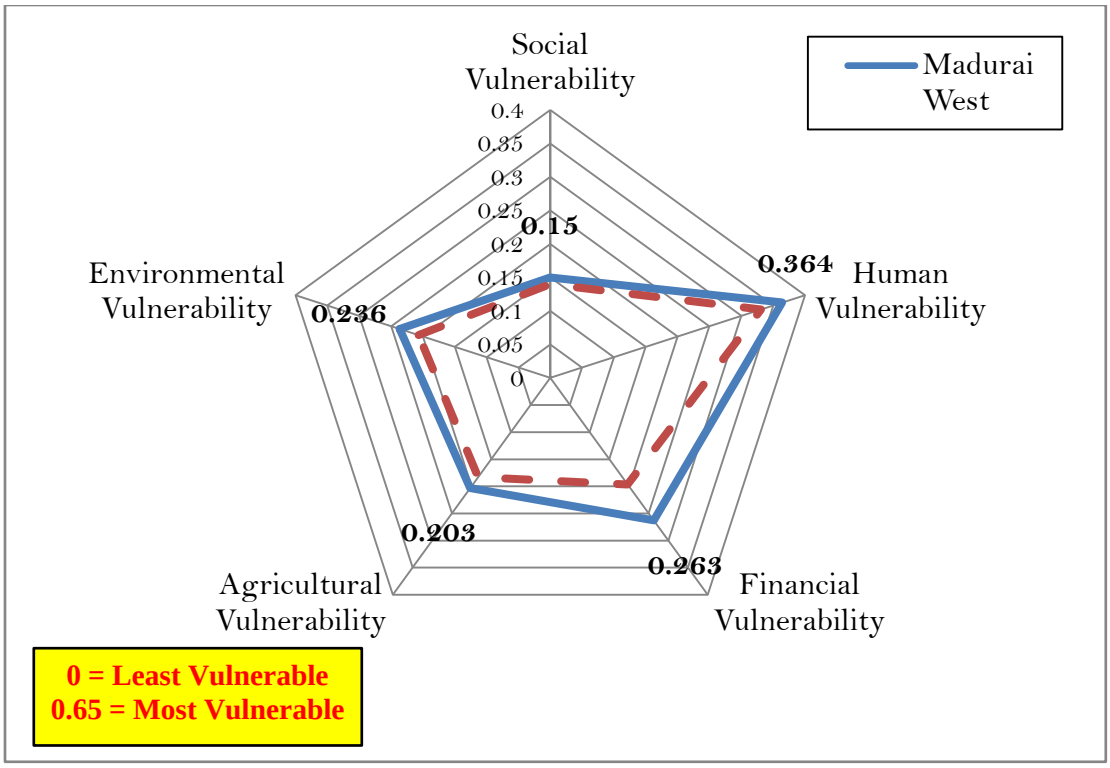


Fig.5: Vulnerability diagram of major components of Madurai West &Melur Blocks.



Overall, Melurblock has lower Livelihood Vulnerability Index than Madurai West block (0.196 vs 0.233), representing the impacts of MGNREG Scheme in Asset creation is huge. The results of eight major components are showed jointly in a spider diagram (fig.4) with scale in 0.05 unit increments, from 0 (lessvulnerable) at the center of the web to 0.4 (most vulnerable) at the outside edge. The diagram clearly explain that Melur block is low vulnerable in all major components of LVI, social, human, financial, employment, agricultural vulnerability, natural, water and land resources. Fig.5. shows that All the five capitals such as Social, Human, Financial, Agricultural and Environmental vulnerability are lower in Melur block than Madurai West block. High deviation shows in Financial vulnerability between the two blocks. These results indicate precisely which capitals should be taken into account for further reducing livelihood vulnerability of these blocks.

The results of the study coincide withIIS Bangalore report 2013 whichreveals that lower vulnerability in the post-MGNREGS scenario in sample villages as compared to pre-MGNREGS in the range of 20 to 41%. This reduction in vulnerability is largely due to land development and water related MGNREGS works implemented which contributed to increased water availability for irrigation, improved soil fertility and increased employment. (IIS,2013)

Major Findings of the Study

❖ While comparing the two Low work blocks of MGNREGS, overall Livelihood Vulnerability Index (LVI) of Sedapatti block is 0.52 where the vulnerability level is moderate, but this value is higher than the overall LVI of 0.497 in Thiruparankundram block.

❖ Out of eight major components of Livelihood vulnerability Index in Low Work Blocks, Sedapatti block is high vulnerable in most components including social, human, employment, agricultural, natural resources and water resources. However, Thiruparankundram block is slightly higher in financial and land resources.

❖ All the five vulnerability capitals in Low Work Blocks namely social, human, financial, Agricultural, and environmental are higher in Sedapatti block than Thiruparankundram block.

❖ In High Work Blocks of MGNREGS,The Overall LVI of Melur block is 0.196. This value is lower than Madurai West Block (0.233).

❖ Melur block is showing Low vulnerability score due to all the five vulnerability capitals such as Social, Human, Financial, Agricultural and Environmental vulnerability are lower in Melur block than Madurai West block.

❖ All major components of LVI viz., social, human, financial, employment, agricultural vulnerability, natural, water and land resources are lower in Melur block than Madurai West block.

❖ Livelihood Vulnerability Index score within the low work blocks (LWB) and high work blocks (HWB) are not much deviated. But the LVI index score between the LWB's and HWB's are varying significantly.

❖ Vulnerability intensity in Low level works blocks (LWB's) is comparatively higher than the High level works blocks (HWB's). It means that Low works area of MGNREGS shows High vulnerability score and high works area of MGNREGS shows low vulnerability score.

Conclusion

The study concluded that proper and optimum utilization of the MGNREG Scheme would ultimately facilitate to sustainable growth of the social, cultural, economical and environmental assets of rural area.

This study only focuses on five major components that influenced Assets creation during the Post MGNREGS implementation. The sub-components used to construct the LVI in this study were based on the current conditions of worksite of MGNREGS, available data from HH surveys and focus group discussion. Therefore, they can only be used as references for other cases with different conditions and available data, and they can be updated or improved when situation is changed (e.g., the people participation in MGNREGS increased by awareness created by Local NGO's and or Government officials).

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