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SUSTAINABLE LIVELIHOOD APPROACH TO TRIBAL FARMERS CULTIVATING VEGETABLES HAVING MEDICINAL VALUES IN MANDLA DISTRICT OF MADHYA PRADESH

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Abstract: *The issue on sustainability has established powerfully in the modern era. Studies on sustainable livelihood have become important involvement and consideration of researchers, policymakers and development program implementers. The article was formulated to focus on key aspects of cultivating vegetables having medicinal values to the tribal farmers, perceptions of their use and development, and the need for sustainable livelihood associated with the existing production. The study was conducted at Mandla, a tribal inhabited district in the state of Madhya Pradesh. Out of the total 9 blocks, 4 blocks, namely, Bijadandi, Ghughri, Mawai, and Morgan were chosen. 8 villages were selected from the 4 blocks based on the high rate of annual yield. A conclusion was drawn by using correlation analysis, factor analysis, and Chi-square test to predict the benefits of cultivating vegetables having medicinal values to the farmers. The correlation coefficient among the annual sales and the growth of farmers was very strong and the high annual yield was positively related with age (0.218**), family size with more number of farmers (0.281**), and the annual income (0.614**). The Chi-square value (χ^2 = 40.251[a]) shows a significant relationship between the number of vegetable farmers and the total annual sales. Results of factor analysis indicate that among the three factors, namely health benefits, production benefits, and environmental benefits, the health benefits (Mean = 4.325, S.D. = 0.90, F = 2.70, significance level = 0.035) from the vegetables influence the most to the farmers for a sustainable livelihood. The results suggest that the production of vegetables having medicinal values can be improved through intercropping participation among the farmers.*

Key Words: *Vegetable farmers, benefits, annual sales, livelihood, and sustainability.*

1. INTRODUCTION :

Tribal who represents ~8.6 % of the total Indian population is the country's oldest ethnic group. There are 700 tribal groups who are very different from one another in their culture and ethnicity (Awais & Khan 2014). Many of them still live under harsh conditions of poverty and deprivation even after 67 years of independence. Through special programs and policies have been developed by the government of India, but the farming activities exercised in the previous three decades in India have progressively been found to be non-sustainable. Production of vegetables is largely commercialized in India but there is a wide gap between the production and the potential productivity (Samantaray *et al.* 2009) and the gap is wider in the rural population. The earnings from cultivating vegetables have been a big issue of food security. Our country's production of vegetables was about 15 (MT) before Independence and it increased to 162.18 (MT) during the year 2012-13 (Kumar & Anokhe, 2017). However, it cannot fulfill the requirements for a sustainable livelihood of the farmers with the ever-increasing population of the country. Natural degradation mostly affects the rural poor, particularly in developing countries. Ecological and human-induced factors such as soil erosion, floods, droughts, soil pollution, water pollution, etc. threaten the livelihood of the rural poor (UNDP 2007). Since above 80 % of the rural poor are engaged in agriculture, improving their livelihood is vital for rural development (Udin 2014). Diversification can reduce the risk of seasonality by making a substitute for income generation during off-peak periods (Ellis 2000). A systemic approach for the production for sustainable livelihoods depends on climatic conditions and adjustment to various changes. Vegetables are considered a side dish because they are normally eaten by the side of staple food. Depending on the type of vegetables, they are consumed as leaves, shoots, roots or fruits. They are sometimes eaten as raw or cooked, in parts or whole. Vegetables are loaded with vitamins, minerals, proteins, carbohydrates, etc. They provide nutrition, and food security which help in poverty eradication the world over.

To boost farmers' income, the Indian government has concentrated on four distinct phases. First, steps needed to decrease farming expenses; second, steps needed to provide them with a fair price for their plants; third, how to decrease waste during farm-to-market transportation of plants; and fourth, attempts to arrange extra farmers' revenue. Chanda *et al* (2003) discuss about sustainability as a final goal or result of sustainable development endeavors whose objective is to fulfill genuine human needs endlessly simultaneous guaranteeing the security of ecological quality, biodiversity and the biological system versatility by incorporating preservation and the executives with social and

financial goals at different social and three-dimensional scales. Anand & Sen (2000) characterized sustainable development and came across the need for future generations to meet their own needs. Farmer groups are also a tool to avoid and overcome free-rider problems and come up with cooperative solutions for the management of resources. In other words, farmers need to work together when in need of a collective action. This article identifies the vegetable farmers' socio-economic characteristics and their relationship with annual sales to satisfaction of Government policy for empowerment generated through the cultivation.

2. LITERATURE REVIEW:

Samanaray *et al.* (2009) studied the constraints of vegetable production faced by tribal vegetable growers in two villages of Umerkote block in Nabarrangpur district of Orissa. Awais & Khan (2014) described the common problems tribal farmers are facing against the adoption of advanced agricultural technologies. They often use traditional technologies for cultivation which are very primitive and cannot improve the annual yield. Mediterranean nations are traditional growers of fruits and vegetables however, they are attempting to stay competitive in the global market by dealing with the present situation and the future prospects (Galanopoulos *et al.* 2009). Hoq *et al.* (2012) recommended redesigning of bundling, processing, dealings, evaluation, and transportation framework so that the medicinal vegetables are familiarized to the outsiders as well as remote areas in Bangladesh. The production and marketing of fresh fruits and vegetables in India are faced with several restrictions such as non-accessibility of good quality seeds, inadequate irrigation, lack of soil testing facilities and inefficiencies of staff (Kumar *et al.* 2004). Cultivating practices such as shifting cultivation carried out in Northern India, not only leads to stagnation of agricultural production but also denudates the hill slopes, large scale of soil erosion and loss of soil fertility (Singh 2000). Considering the above-mentioned problems the recent work was conducted with the following objectives: to identify the benefits and challenges of vegetables having medicinal values farming in 4 villages of Mandla district, to highlight the relationship between annual sales and the growth of vegetable farmers and to measure the benefits of vegetables having medicinal values farming for a sustainable livelihood.

3. MATERIALS AND METHOD :

Madhya Pradesh (MP) has an area of 308,252 sq. km with rich biodiversity. The state is inhabited by a large tribal community of which 28 major tribes spread across many regions in the state. Their original habitation is dominantly reliant on the forest for food, shelter, and social wellbeing. They have their native culture, food habits, and medicinal system related to nature. The state forests have the diverse traditional folk medicines associated with the use of medicinal plants which are herbs, shrubs, climber or trees. They are used by local vaidyas and traditional herbal healers. The knowledge of traditional base medicines helps in conservation of the medicinal plants/vegetables. Mandla district is a tribal inhabited region of MP, an eastern district of Jabalpur division, lying between the latitudes 22°02' and 23°22' N and longitudes 80°18' and 81°50' E. The district has an area of 5,800 sq. km. Kharif and Rabi crops are generally grown in 186.3 thousand hectares and 88.80 thousand hectares of land respectively. Agriculture along with forestry, animal husbandry, and fisheries are their principal source of livelihood. A list of etymological major vegetable crops grown by the local people of Mandla district is presented in Table 1.

Study Site

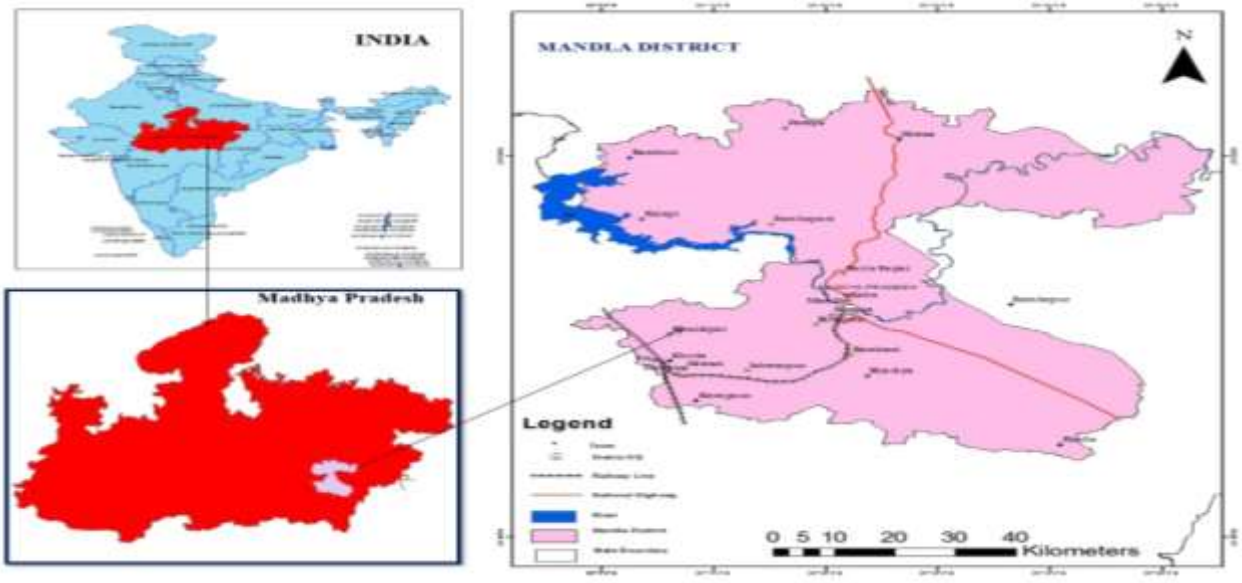

Figure 1. Study area on the Map of Mandla District

Table 1. Etymological Major Vegetable Crops Grown by the People of Mandla District

Sl. no.	Botanical name and Family	Common name/ Local name	Etymology
1.	*Allium cepa* Amaryllidaceae	Red onion	Cold, fever, allergy bacterial infection, congestion and sore throat, effectively treats an earache (Harris, et al., 2001)
2.	*Allium sativum* Amaryllidaceae	Garlic	Cardiovascular illness (including atherosclerosis, elevated cholesterol, elevated blood pressure), vagina for yeast infections, and cancer (Harris, *et al.*, 2001)
3.	*Brassica oleracea* Brassiaceae	Broccoli	Anticancer, especially in the prevention and treatment of gastric cancer, breast cancer, and effects is the best (Lim, 2012)
4.	*Brassica oleracea Linn. Var.* Brassiaceae	White cabbage	Diuretic, laxative, stomachic, antihelmintic, digestive, reduction of tonic cholesterol, anticancer, and antifungal (Lim, 2015)
5.	*Brassica oleracea var. botrytis* Brassiaceae	Cauliflower	Cancer prevention, especially for the following cancer kinds: cancer of the bladder, breast cancer, cancer of the colon, cancer of the prostate and cancer of the ovaries (Singh *et al.*, 2006)
6.	*Capsicum annuum*L. var. annuum Solanaceae.	Green pepper	Atonic gout, dyspepsia, tympanitis, lethargic affectionsand paralysis (Loizzo, *et al.*, 2008)
7.	*Capsicum frutescens*L. Solanaceae.	Chili pepper	Skin disease, headache, night vision, tuberculosis, stomach pain, back pain, cough, blood clotting, and chest pain (Koffi-Nevry, *et. al.*, 2012)
8.	*Carica papaya L.* Cariaceae	Papaya	Illness of the skin, treating ulcers of the stomach, diphtheria, constipation, kidney failure and cancer (Krishna, *et al.*, 2008)
9.	*Citrulluslanatus* Cucurbitaceae	Watermealon	Prevent cancer, cardiac wellness, maintain your flesh hydrated, reduce inflammation and oxidative stress, avoid macular degeneration, alleviate muscle soreness, improve digestion, improve skin and hair (Erhirhie, *et al.*, 2014)
10.	*Coriandrumsativum Linn.* Apiaceae	Coriander	To stimulate the flow of gastric juices and sweeten the breath, carminative, expectorant, aromatic, narcotic, stimulated and stomach characteristics and the raw ones are chewed (Mahendra & Bisht, 2011)
11.	*Cucumis sativus* Cucurbitaceae	Cucumber	Anti-aging, Improve bone and joint function, better digestion, healthier skin, hair and nails. Helps in weight loss, lower blood pressure, keeps hydrated and reduces risk of kidney skin (Panda, 1999)
12.	*Cucurbita pepo* Cucurbitaceae	Pumpkin	Antirheumatic, demulcent, laxative, diuretic, nervous, taenifugeous, good immune booster for the treatment of kidney problems, prostate hyperplasin and intestinal parasites (Perez Gutierrez, 2016)
13.	*Curcuma longa* Zingiberaceae	Turmeric	Preventing heart disease, cancer, Alzheimer's, anti-inflammatory, antioxidant also improve depression and arthritis symptoms (Ammon, & Wahl, 1991)
14.	*Daucus carota* Apiaceae	Carrot	Dropsy, urine retention, gravel, stomach issues, flatulence, nephritis, ulcer,

			amenorrhea, eczema, itching, hepatitis, cancer, painful urination (strangleness), dysmenorrhea, abcesses, poor injuries and colic (Tang, & Eisenbrand, 2013)
15.	*Lactuca sativa* Asteraceae	Lettuce	Sedative, digestive, diuretic, nacrotic, insomnia, anxiety, neurosis, dry coughs, rheumatic pain and remove toxins (Al-Khalil, 1995)
16.	*Moringa oleifera*Lam. Moringaceae	Drumstick	Cardiac, anti-tumor, anti-pyretic, anti-epileptic, anti-inflammatory, anti-ulcerative, anti-spasmodic, diuretic, anti-hypertensive, cholesterol-reducing, anti-oxidant, anti-diabetic, hyperlipidic, anti-bacterial and antifungal activity (Anwar, 2007)
17.	*Pisum sativum* Fabaceae	Garden pea	Prevent high blood pressure, heart health, anticarcinogenic, osteoporosis, candida infection, bronchitis, arthritis, and alzheimer's disease (Vohora, *et al.*, 1973)
18.	*Raphanus sativus Linn.* Brassicaceae	Radis	Hypoglycemic potential combined with antidiabetic, gastrointestinal (GI), prokinetic, and powerful antioxidant activity (Kala, *et al*., 2005)
19.	*Solanum melongena* Solanaceae	Brinjal	Lowering cholesterol, fighting infections, preventing degenerative diseases, anti-viral and anti-inflammatory (Agoreyo, *et al.*, 2012)
20.	*Zingiber officinale* Zingiberaceae	Ginger	Dyspesia, gastroparesis, rheumatoid arthritis, osteoarthritis, or joint muscle injury, nausea motion sickness, and vomiting linked to short-term relief of pregnancy (Mascolo, Jain*et al*., 1989)

Vegetables add minerals, vitamins, and fiber to the diet. They are the great sources of minerals among the crops and add to the RDA (Recommended dietary allowances) of essential nutrients. Minerals are naturally inorganic substances with definite chemical composition and an orderly atomic arrangement. They are very significant and vital dietary components needed for ordinary body tissue metabolic activity. Vitamins are organic compounds that occur as organic precursors in natural ingredients, particularly in vegetables. They assist in the bodily absorbance of calcium and phosphorus, necessary for the development and maintenance of the bone. Vitamins are involved in blood clotting and normal nervous system functioning (Chatterjea & Shinde, 2011).

The present study is descriptive. The study was carried out through a field survey and interview of the vegetable farmers. Out of the total 9 blocks of the Mandla district of Madhya Pradesh, 4 blocks, namely, Bijadandi, Ghughri, Mawai, and Morgan were randomly chosen as medicinal vegetable farming blocks. 8 villages were selected from the 4 blocks based on the high production rate of medicinal farming activity. More than 100 farmers were collected randomly for the study. First hand and original information's through questionnaires. The collected data for the analysis was first-hand questionnaires comprises of five-point Likert scales signifying strongly disagree to strongly agree to extent benefit of medicinal vegetable and a three-point Likert scales signifying from dissatisfaction to satisfied to spread farmer fulfillment. To test the consistency of the items used for analysis, reliability test was conducted. The data analysis was carried out by using SPSS 21. Mean, standard deviation, and ranking have been calculated. A conclusion was derived by calculating correlation, factor analysis, and Chi-square test to predict the benefits of the vegetables having medicinal values farming for a sustainable livelihood.

4. RESULTS AND DISCUSSION:

The study was conducted to decide the respondent socio demographic characteristics. A total of 78 male and 32 female were randomly selected. Majority of them were age from 45 -55 years. Many of the respondents were educated (61.8 % of which 39.1 % completed elementary education and 22.7 %) completed secondary education, and 2.7 %

completed higher education the illiterate represents 34.5 % of the respondents. The minimum age of the members was 25 years while the maximum was 74 years, with a mean age of 45-55 years. In addition, 87 (89.1 %) farmers were married, 11 (10 %) were unmarried, and 2 (0.9 %) were either widowed or separated. More than (83.7 %) of the respondents belongs to nuclear family and 16.3 %, joint family. Majority of the respondents were having annual income range from Rs. 18000 to Rs. 30000. Due to the seasonal employment and agricultural occupation, their income level is low. In this study, annual yield is positively related with age of the respondent (0.218^{**}), family size having more number of farmers (0.281^{**}), number of family members employed (0.232^{**}) and the annual income of the household (0.614^{**}) whereas the ability to manage with the experiences has a negative correlation with annual production ($-.186^{**}$). This shows that annual production and socio-demographic condition are highly and positively correlated except the variable ability to manage with the income. It indicates that socio-demographic status influences the annual yield of vegetable farming in Mandla District.

Table 2. Correlation Matrix

Sl. No.	Details of the study	Mean	S.D.	1	2	3	4	5	6	7
1	Total Annual Yield	3.3091	1.61839	1						
2	Age of the Respondent	3.7182	1.00578	.218(**)	1					
				0						
3	Family Size	3.8727	1.00557	.281(**)	.141(**)	1				
				0	0.006					
4	No. of family members employed	3.2158	0.80615	.232(**)	.263(**)	.410(**)	.377(**)	1		
				0	0	0	0			
5	Annual Income	5.1272	2.39498	.614(**)	.139(**)	.226(**)	.220(**)	.163(**)	1	
				0	0.007	0	0	0.001		
6	Experiences	1.5364	0.50096	-.186(**)	-0.005	-0.016	0.031	-0.093	-.305(**)	1
				0	0.924	0.762	0.55	0.069	0	

***Correlation is significant at the 0.01 level (2-tailed).*

** Correlation is significant at the0.05 level (2-tailed).*

Table 3. Annual Sales to the Growth of Vegetables Farmers

Total Annual Sales (in Rs.)	Growth of Vegetables Farmers having Medicinal values					Total
	Strongly Satisfied	Satisfied	Neutral	Dissatisfied	Strongly Dissatisfied	
Upto 50,000	0 (0.0)	10 (62.5)	0 (0.0)	6 (37.5)	0 (0.0)	16 (100.0)
50,001 - 100,000	1 (2.4)	5 (11.9)	9 (21.4)	20 (47.6)	7 (16.7)	42 (100.0)
100,001 - 150,000	1 (3.71)	0 (0.0)	14 (51.86)	9 (33.33)	3 (11.1)	27 (100.0)
150,001 - 2,00,000	0 (0.0)	4 (26.7)	1 (6.7)	3 (20.0)	7 (46.6)	15 (100.0)
2,00,001 & above	1 (10.0)	2 (20.0)	1 (10.0)	3 (30.0)	3 (30.0)	10 (100.0)
Total	3	21	25	41	20	110

Source: *Computed from survey data*

Figures in the Parenthesis indicates the percentage

Table 4. Result of the Hypothesis Testing Chi-square

Statistics	df	P-value	Significance
40.251^{a}	16	.001	Significant

a. 18 cells (72.0%) have expected count less than 5. The minimum expected count is .30

Source: *Computed using SPSS 21*

The calculated value of Chi-square (χ^2) = 40.251[a] clearly reveals that the P-value is 0.001 (Pearson) and it is lesser than the cut off value 0.05. Hence, it is lesser than the table value, the difference is significant. There is an association between the growth of vegetables farmers having medicinal values and total annual sales of vegetables.

110 questionnaires and the fifteen variables of benefits of the vegetable farmers were used to conduct the Reliability tests in order to test the internal consistency of the statements under each construct. It is important to know if the internal consistency of each underlying statement is consistent with each construct. In this study, the internal consistency is 0.94 at **(**0.05**)** level of significance. Therefore, it is concluded that the data has a good reliability.

Table 5. Explorative Factor Analyses

Statement	Component		
	Health Benefits	Production Benefits	Environmental Benefits
Vegetables provide vital nutrients for maintaining overall health of the body	0.960		
Utilization and medicinal value	0.952		
Beneficial for healthy skin and hair	0.936		
Including vegetables in our diet can reduce the risk of cancer, stroke, etc.	0.931		
Rich in antioxidant properties	0.912		
Quality foodstuff	0.901		
Helps to improve immunity	0.898		
Aids in maintaining a healthy reproductive system	0.892		
Insect and disease control	0.876		
Avoid chemicals	0.862		
Locally available input		0.900	
Varieties of food production		0.884	
Reduce the input cost		0.871	
Impose environmental cost			0.894
Livestock management in farming			0.869
Eigenvalues after rotation	9.582	2.009	1.417
Variance explained by individual factor after varimax rotation (%)	63.87	13.39	9.44
Total Variance Explained: 86.71	HB	PB	EB

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.a. Rotation converged in 5 iterations.

Factor analysis is considered as a suitable method for determining construct validity. The exploratory factor analysis indicated that variables within the construct of medicinal vegetable benefits were loading on the attitude of farming for a sustainable construct. An overview of the rotated component matrix is presented by Table 5. All items below 0.86 were cut off to better understand which components the variables are loading on. In the factor loadings, the correlation between the factor and the variables are in all cases lower than 0.8, which indicates a high correlation. The total variance explained by these three factors is 86.71 %. The analysis gives an indication in support of the validity of the measurement. The three factors identified were health benefit, production benefit, and economic benefit.

Table 6. Extraction Factors of Benefit Vegetables Having Medicinal Values

Statements	N	Mean	Std. Deviation
Health Benefits	110	4.325	.909
Production Benefits	110	4.315	.860
Environmental Benefits	110	4.568	.592

Computed from survey data

To measure the factors of benefit, vegetables having medicinal values three items were constructed. It was found that among the mean value of the items, health benefit has the largest influence i. e (Mean = 4.325, S.D = 0.90). For the production benefit and the environmental benefit, factors are not significant, i. e (Mean = 4.315, S. D = 0.86) and (Mean = 4.568, S.D = 0.59). The results show that health benefits factor was more effective to the contribution of vegetables having medicinal values farming for a sustainable livelihood.

Table 7. ANOVA Result

Statements		Sum of Squares	df	Mean square	F	Sig.
Health Benefits	Between Groups	6.497	4	1.624	2.70	0.035
	Within Groups	74.192	105	0.707		
	Total	80.689	109			
Production Benefits	Between Groups	8.412	4	2.103	2.299	0.064
	Within Groups	81.773	105	0.779		
	Total	90.186	109			
Environmental Benefits	Between Groups	1.39	4	0.348	0.99	0.416
	Within Groups	36.848	105	0.351		
	Total	38.239	109			

Computed from survey data

For 4 degrees of freedom in the numerator and 105 degrees of freedom in the denominator, the critical value of F at 5% level of significance in all the variables accept health factors degrees of freedom (4, 105), F = 2.7 and significance of 0.035.The calculated value is lower than the table value. This result proved that significant relation among vegetables having medicinal values farming and health benefits.

5. FINDINGS:

The highest number of the respondents is between the age group of 45-55 years, who have the abilities to have a vision for the future and for decision making in the family. It is inferred that the male respondents are greater than the female respondents. This may be because males generally have better access to education and opportunities whereas females have low vitality, and are provided low labor charge. The study found that the main occupation of the respondents of 57.5% in agriculture and 23.5% opt for self-employment. Most of the families prefer wage labor other than the agriculture and 29.0% respondents makes theirs living by selling vegetables and grocery shops. The majority of the sample farmers are from nuclear families constituting 83.7% of the total farmers and joint families constitute only 16.3%. Unemployment and seasonal employment are very common among the villagers. Almost 61.8% of the entire respondent was found to be a lack of quality education. The correlation coefficients reveal that high rate of annual yield is positively related to the age of the respondent (0.218^{**}), family size with more number of males (0.281^{**}), number of family members employed (0.232^{**}) and the annual income of the household (0.614^{**}). It indicates that socioeconomic status influences the annual production of vegetables having medicinal values farmers. The study highlights that vegetable farmers prefer better seeds as the most important reason for the growth of vegetables in the village with a mean value of 4.66, whereas availability of fertilizers scores the lowest with a mean value of 3.45. The calculated value of Chi-square (χ^2) = 40.251^a suggests a significant relationship between the growth of farmers and total annual sales of vegetables. The internal consistency was 0.94 at (0.05) level of significance. The factor loading (0.8) indicates a high correlation among the variables. The total variance explained by three factors is 86.71% the validity of the measurement instrument approves the three factors identified as health benefit, production benefit, and economic benefit.

6. CONCLUSION & SUGGESTION :

The study shows that development in the cultivation of vegetables having medicinal values can act as a significant role in the sustainable livelihood of villagers in the Mandla District. However, the generally low educational qualification, big sized families and the low in their annual income are the major challenges the farmers face for adopting advanced technologies and the large scale production of the vegetables having medicinal values at the commercial level. They use locally available vegetables in various forms which are of highly medicinal. As the families in the area possess their own land, the development of vegetables will benefit them. Moreover, these vegetables add minerals, vitamins, and fiber to the diet. They are great sources of minerals that are included in the recommended diets of essential nutrients. Vitamins are organic compounds that occur as organic precursors in natural ingredients, particularly in vegetables. They assist in the bodily absorbance of calcium and phosphorus, necessary for the development and maintenance of the bone. The factor analysis reveal that the health benefits (Mean = 4.325, S.D. = 0.90, F = 2.70, significance level = 0.035) influence the most to the vegetable farming for a sustainable livelihood. The above results suggest that the production

of vegetables having medicinal values can be improved through intercropping participation among the farmers. It is clear that the accomplishment of cultivation will depend on the returns from vegetables having medicinal values, compared with different harvests. The review affirms that development of vegetables having medicinal values is a suitable choice to improve the livelihoods of those poor farmers. However, the extent to which the government supports the cultivation of the vegetables with enormous market potential is rarely seen at the ground level. The observation shows that the desired changes can bring good livelihood conditions for the cultivation of significant vegetables having medicinal values. Finally, maintaining the characteristics of habitats for vegetation serve for the conservation of the natural environment.

REFERENCES:

1. Agoreyo, B. O., Obansa, E. S., and Obanor, E. O. (2012): Comparative nutritional and phytochemical analyses of two varieties of *Solanum melongena*. *Science World Journal*, *7*(1), pp5-8
2. Al-Khalil, S. (1995): A survey of plants used in Jordanian traditional medicine. *International Journal of Pharmacognosy*, *33* (4), pp17-323
3. Ammon, H. P., and Wahl, M. A. (1991). Pharmacology of *Curcuma longa*. *Planta medica*, *57*(01), 1-7
4. Anand, S., and Sen, A. (2000). Human development and economic sustainability. *World Development*, *28*(12), 2029-49
5. Anwar, F., Latif, S., Ashraf, M., and Gilani, A. H. (2007): *Moringa oleifera*: a food plant with multiple medicinal uses. *Phytotherapy Research: An International Journal Devoted to Pharmacological and Toxicological Evaluation of Natural Product Derivatives*, *21*(1), pp17-25
6. Awais, M., & Khan, N. (2014). Adoption of new agricultural technology: A case study of Buksa tribal farmers in Bijnor District, Western Uttar Pradesh, India. *International Journal of Agriculture, Environment and Biotechnology*, *7*(2), pp403-40*8*
7. Damiani, O. (2003). The adoption of organic agriculture among small farmers in Latin America and the Caribbean: Thematic evaluation. *Rome: IFAD*
8. Ellis, F. (2000). *Rural livelihoods and diversity in developing countries*. Oxford university press.
9. Erhirhie, E. O., and Ekene, N. E. (2014): Medicinal values on *Citrullus lanatus* (watermelon): pharmacological review. *International Journal of Research in Pharmaceutical and Biomedical Sciences*, *4*(4), pp1305-1312
10. Galanopoulos, K., Nilsson, F. O., Wajnblom, E., and Surry, Y. (2009). Fruit and vegetable production in the new millennium: Will Mediterranean production satisfy increasing European demand?. *Outlook on Agriculture*, *38*(3), 235-242
11. Harris, J. C., Cottrell, S., Plummer, S., and Lloyd, D. (2001). Antimicrobial properties of *Allium sativum* (garlic). *Applied microbiology and biotechnology*, *57*(3), 282-6
12. Hoq, M. S., Raha, S. K., and Sultana, N. (2012): Value addition in vegetables production, processing and export from Bangladesh. *Bangladesh Journal of Agricultural Research*, *37*(3), pp 377-388
13. Kala, C. P., Farooquee, N. A., and Majila, B. S. (2005). Indigenous knowledge and medicinal plants used by Vaidyas in Uttaranchal, India
14. Kendler, B. S. (1987). Garlic (*Allium sativum*) and onion (*Allium cepa*): a review of their relationship to cardiovascular disease. *Preventive medicine*, *16*(5), 670-85
15. Krishna, K. L., Paridhavi, M., and Patel, J. A. (2008). Review on nutritional, medicinal and pharmacological properties of Papaya (*Carica papaya Linn*.)
16. Kumar, R., and Anokhe, A. (2017): Case Study organic farming of Vegetables: Prospects and Scenario. *Global Journal of Bio-Science and Bio-Technology*, 6(2), pp 390-4
17. Lim, T. K. (2012). *Quercus infectoria*. In *Edible Medicinal And Non-Medicinal Plants* (pp. 16-26). Springer, Dordrecht
18. Lim, T. K. (2015). *Brassica oleracea* (Gongylodes group). In *Edible medicinal and non medicinal plants* (pp. 768-776). Springer, Dordrecht
19. Lim, T. K. (2014). *Calendula officinalis*. In *Edible Medicinal And Non-Medicinal Plants* (pp. 213-244). Springer, Dordrecht
20. Loizzo, M. R., Tundis, R., Menichini, F., Statti, G. A., & Menichini, F. (2008). Influence of ripening stage on health benefits properties of *Capsicum annuum* var. *acuminatum L*.: in vitro studies. *Journal of medicinal food*, *11*(1), 184-189
21. Mahendra, P., and Bisht, S. (2011): *Coriandrum sativum*: A daily use spice with great medicinal effect. *Pharmacognosy Journal*, *3*(21), pp84-8
22. Mascolo, N., Jain, R., Jain, S. C., and Capasso, F. (1989): Ethnopharmacologic investigation of ginger (*Zingiber officinale*). *Journal of ethnopharmacology*, *27*(1-2), pp129-40

23. Moriba, S., Kandeh, J. B., and Edwards, M. C. (2011). Diffusion of technologies by the Tikonko agricultural extension centre (taec) to farmers of the Tikonko chiefdom in sierra leone: impacts, problems, proposed solutions, and an updated outlook [Electronic version]. *Journal of International Agricultural and Extension Education*, *18*(3), pp45-60
24. Mundlak, Y., Larson, D., and Butzer, R. (2004): Agricultural dynamic in Thailand, Indonesia and the Philippines. *Australian Journal of Agricultural and Resource Economics*, *48*(1), pp95-126
25. Parrott, N., Olesen, J. E., and Høgh-Jensen, H. (2006). Certified and non-certified organic farming in the developing world. *Global development of organic agriculture: Challenges and prospects*, 153-76
26. Perez Gutierrez, R. M. (2016). Review of Cucurbita pepo (pumpkin) its phytochemistry and pharmacology. *Medicinal chemistry*, *6*(1), 12-21
27. Piesse, J., Doyer, T., and Vink, N. (2005): The changing role of grain cooperative in the transition to competitive markets in South Africa. *Journal of Comparative Economics*, *33*(1), pp197-218
28. Samantaray, S. K., Prusty, S., and Raj, R. K. (2016): Constraints in vegetable production-experiences of tribal vegetable growers. *Indian Research Journal of Extension Education*, *9*(3), pp32-4
29. Singh, J., Upadhyay, A. K., Bahadur, A., Singh, B., Singh, K. P., and Rai, M. (2006). Antioxidant phytochemicals in cabbage (*Brassica oleracea L.* var. *capitata*). *Scientia Horticulturae*, *108*(3), 233-7
30. Singh, M. S. (2017): Livelihood Status of Rural Tribal Framer through Traditional Cultivation in Manipur State of North-East India. *Splint International Journal of Professionals*, *4*(8), pp21-7
31. Tang, W., and Eisenbrand, G. (2013). *Chinese drugs of plant origin: chemistry, pharmacology, and use in traditional and modern medicine*. Springer Science & Business Media
32. Udin, N. (2014): Organic Farming Impact on Sustainable Livelihoods of Marginal Farmers in Shimoga District of Karnataka. *American Journal of Rural Development*, *2*(4), pp81-88
33. Vohora, S. B., Rizwan, M., and Khan, J. A., (1973). Medicinal uses of common Indian vegetables. *Planta medica*, *23*(04), 381-393
34. Watkins, K. (2007). Human Development Report 2007/8. Fighting Climate Change: Human Solidarity in a Divided World. *Fighting Climate Change: Human Solidarity in a Divided World (November 27, 2007). UNDP-HDRO Human Development Report*
35. Weinberger, K., & Lumpkin, T. A. (2007). Diversification into horticulture and poverty reduction: a research agenda. *World development*, *35*(8), 1464-80