Ahmednagar Jilha Maratha Vidya Prasarak Samaj's
SHRI DHOKESHWAR COLLEGE, TAKALI DHOKESHWAR
Tal:-Parner, Dist.:- Ahmednagar. 414304 (M.S.)
☏(Off.): 02488- 295395
NAAC ACCREDIATED "B"GRADE

- **Id. No.PU/AN/047/1994**
- **Email:** tdcollege@gmail.com
- **Web:** www.shridhokeshwarcollege.org

Dr. Shri Laxmanrao Shri. Matkar
Principal
M.Sc, Ph.D, L.L.B, D.Sc(U.S.A)
Mob.No.9011503334

3.3.1 Number of research papers published on UGC website in 2021-22 years

Sr. No.	Name of Teacher	Departments
1	Mr. Dalavi S. D.	Zoology
2	Mr. Zaware R.P.	Botany
3	Dr. Jadhav E.G.	Hindi
4	Mr. Dalavi S.D.	Zoology
5	Mr. Gavit P. M.	History
6	Mr. Gavit P. M.	History
7	Mr. Gavit P. M.	History
8	Mr. Thombe S. Z.	English

प्राचार्य
श्री. ढोकेश्वर कॉलेज
टाकळी ढोकेश्वर, ता. पारनेर, जि. अ.नगर

21-22
UGC Care

J. Exp. Zool. India Vol. 25, No. 2, pp. 2399-2404, 2022 | www.connectjournals.com/jez | *ISSN 0972-0030*
DocID: https://connectjournals.com/03895.2022.25.2399 | eISSN 0976-1780

STUDIES ON WATER QUALITY OF MANDOHOL RESERVOIR IN RELATION TO PISCICULTURE, AHMEDNAGAR DISTRICT, MAHARASHTRA

S. D. Dalavi* and B. A. Pawar[1]

Department of Zoology, Shri Dhokeshwar College, Takali Dhokeshwar, Tal. Parner, Ahmednagar - 414 304, India.
[1]Department of Zoology, P.V.P. College, Pravaranagar, Tal. Rahata, Ahmednagar - 413 713, India.
*e-mail : dalvi25592samir@gmail.com

(Received 30 April 2022, Revised 7 July 2022, Accepted 22 July 2022)

ABSTRACT : The present work deals with the water quality of Mandohol reservoir in Ahmednagar district, Maharashtra during September 2020 to August 2021 in order to assess its suitability for pisciculture. Various physico-chemical parameters determined reveals that seasonal fluctuations in water colour, electrical conductivity, total dissolved solids, pH, dissolved oxygen, total alkalinity and hardness, nitrate, nitrite, BOD and COD in all the seasons and temperature during monsoon and summer and chloride during only summer are within the desirable limits for fish and fisheries practices. However, somewhat low level of calcium, magnesium and sulphate in all seasons, and water temperature during post-monsoon to winter and chloride during monsoon to winter, and high level of transparency and phosphates in all the seasons were recorded. These parameters need to be modifying in order to favour the fish culture.

Key words : Mandohol reservoir, water quality, pisciculture.

How to cite : S. D. Dalavi and B. A. Pawar (2022) Studies on water quality of Mandohol Reservoir in relation to pisciculture, Ahmednagar district, Maharashtra. *J. Exp. Zool. India* **25**, 2399-2404. DocID: https://connectjournals.com/03895.2022.25.2399

INTRODUCTION

Reservoirs are man-made lakes created by impounding river water for the purpose of irrigation, power generation, flood control and industrial water needs. These water sheets, by virtue of their sheer magnitude and due to their high biogenic production potential, constitute one of the most important resources for inland fisheries development in the country. It is estimated that the reservoir fisheries development has the potential to generate additional national income to the tune of Rs. 100 crores per year and can provide employment to lakhs of fishermen and workers in the ancillary industries (Srivastava and Reddy, 1983).

In order to utilize freshwater bodies successfully for abundant fish production, it is very significant to study the physico-chemical characteristics which influence the biological productivity of the water body. However, today many pollutants are directly or indirectly released in to water bodies might lead to a change in their trophic status and render them unsuitable for aquaculture. Pollution of water caused by various human activities affects fish species (Hidaka and Tatsukawa, 1985). Several physico-chemical or biological factors could act as stressors and adversely affect fish growth and reproduction (Iwama *et al*, 2000). Hence, regular monitoring of physico-chemical and biological water quality parameters is essential to determine status of water body in relation to fish culture.

Earlier studies on water quality parameters of some freshwater bodies in relation to fish culture were made by Iwama *et al* (2000), Usha *et al* (2006), Kadam *et al* (2007), Ranjan *et al* (2008), Nooralam *et al* (2009), Pawar and Pandarkar (2011), Biswas *et al* (2012), Bawane and Jadhav (2013), Singh *et al* (2014), Bedwal and Mathur (2015), Vikhe and Pawar (2016), Mondal *et al* (2017), Lokhande and Pawar (2018), Kumar *et al* (2021) and Kumar *et al* (2022). Present study aims at investigating the monthly variations if any, in physico-chemical water quality parameters of Mandohol reservoir, and if so, whether or not they are within desirable limits for fish and fisheries practices.

MATERIALS AND METHODS

Mandohol reservoir selected as a fresh water body for the present investigation is a man-made perennial reservoir formed by construction of an earth-fill type of dam across a minor stream, which joins to Mula River. This reservoir is located (latitude 19°11'56"N and longitude 74°18'28"E) at Karjule Hareshwar village near Takali Dhokeshwar, Parner taluka, Ahmednagar district, Maharashtra. It lies in the hilly region and is a rain fed freshwater body containing water throughout the year and constitutes as a major water resource for drinking, agriculture and fishing activities.

Water samples from three different sites were collected monthly in the morning hours, between 9.30 a.m. to 11.30 a.m. The clean plastic bottles were used for sampling and immediately samples were brought to the laboratory for analysis.

The Temperature, pH, TDS and Electrical conductivity were recorded on the field by Eutech PCS Testr 35, multi-parameter Singapore. The other parameters *viz.*, DO and BOD were estimated by modified Winkler's method, alkalinity, hardness, calcium, magnesium and chloride by titration method and nitrate, nitrite, phosphate and sulphate by spectrophotometer (Elico, SI 171 mini-Spec) and COD by open reflux method on the same day in the laboratory (Golterman *et al*, 1978 and APHA, 2017).

RESULTS AND DISCUSSION

Monthly variations of physico-chemical parameters of Mandohol reservoir are shown in Table 1. The data was divided in to four seasons, representing monsoon (June-September), post-monsoon (October-November), winter (December-February) and summer (March-May) and is presented in Fig. 1 (A-F).

Physico-chemical parameters like pH, temperature, dissolved oxygen, ammonia-nitrogen, phosphorus and chlorides have a greater influence on the survivability of the fishes (Devi Prasad *et al*, 2009). In the present study water colour varied from greenish, clear, light muddy and muddy brown. It was muddy brown during monsoon, light muddy during post-monsoon, greenish during winter and light muddy during summer.

Temperature sets the pace of fish metabolism by controlling molecular dynamics (diffusibility, solubility and fluidity) and biochemical reaction rates. Temperature of water affects behavior of aquatic organisms, solubility of gases and salts in water (Singh *et al*, 2014). In the present study, it was observed that the temperature of reservoir water varied from 19.4 (December) to 26.6 °C (May). It was minimum (20.80°C) during winter and maximum (25.35°C) during monsoon. The atmospheric temperature ranged between 22.13 (December) and 30.03°C (May), being minimum (23.5°C) during winter and maximum (29.30°C) during summer. Change of water temperature was found in accordance with seasonal changes. Sharma and Gupta (1994) had reported that fish growth was better at a temperature range of 14.5 to 38.6°C. The water temperature in Mandohol reservoir was found ideal for fish growth and productivity.

Transparency ranged between 73.66 (August) to 115.06 cm (January). It was minimum (85.54 cm) during monsoon and maximum (109.86 cm) during winter. Similar results were also reported by Kamal *et al* (2007) and Kumar *et al* (2021). In the present investigation, Secchi disc transparency was over 60 cm, indicated too little plankton, fishes do not had enough natural food to eat (FAO).

Electrical conductivity varied from 202.33 (December and February) to 262.66 µS/cm (August). It was minimum (203.22 µS/cm) during winter and maximum (249 µS/cm) during monsoon.

Total dissolved solids ranged between 126 (January) to 240.33 mg/l (August). It was minimum (154.21 mg/l) during winter and maximum (221.16 mg/l) during monsoon.

pH is a measure of hydrogen ion concentration in water and indicates how much water is acidic or basic. Water pH affects metabolism and physiological processes of fish. pH of water is considered as one of the most important chemical parameters since aquatic organisms are well adapted to specific pH range and do not withstand abrupt changes in it (George, 1997). In the present study pH ranged between 8.12 (September) to 8.92 (June). It was minimum (8.46) during post-monsoon and maximum (8.53) during summer. Highest values were observed during summer, might be due to low water level and presence of variety of waste in the water. The pH was found to be on the alkaline side throughout the study period which favours the growth of fishes (Swingle, 1967). Similar observations were also made by Kumar *et al* (2022).

Tarzwell (1957) has suggested that a minimum of 3 mg/l dissolved oxygen is necessary for healthy fish and other aquatic life. In the present study dissolved oxygen ranged between 5.99 (May) to 9.33 mg/l (January). It was minimum (7.26 mg/l) in summer and maximum (8.80 mg/l) during winter. Similar observations were also recorded by Mondal *et al* (2017) and Pawar *et al* (2018). Increased levels of dissolved oxygen during winter months

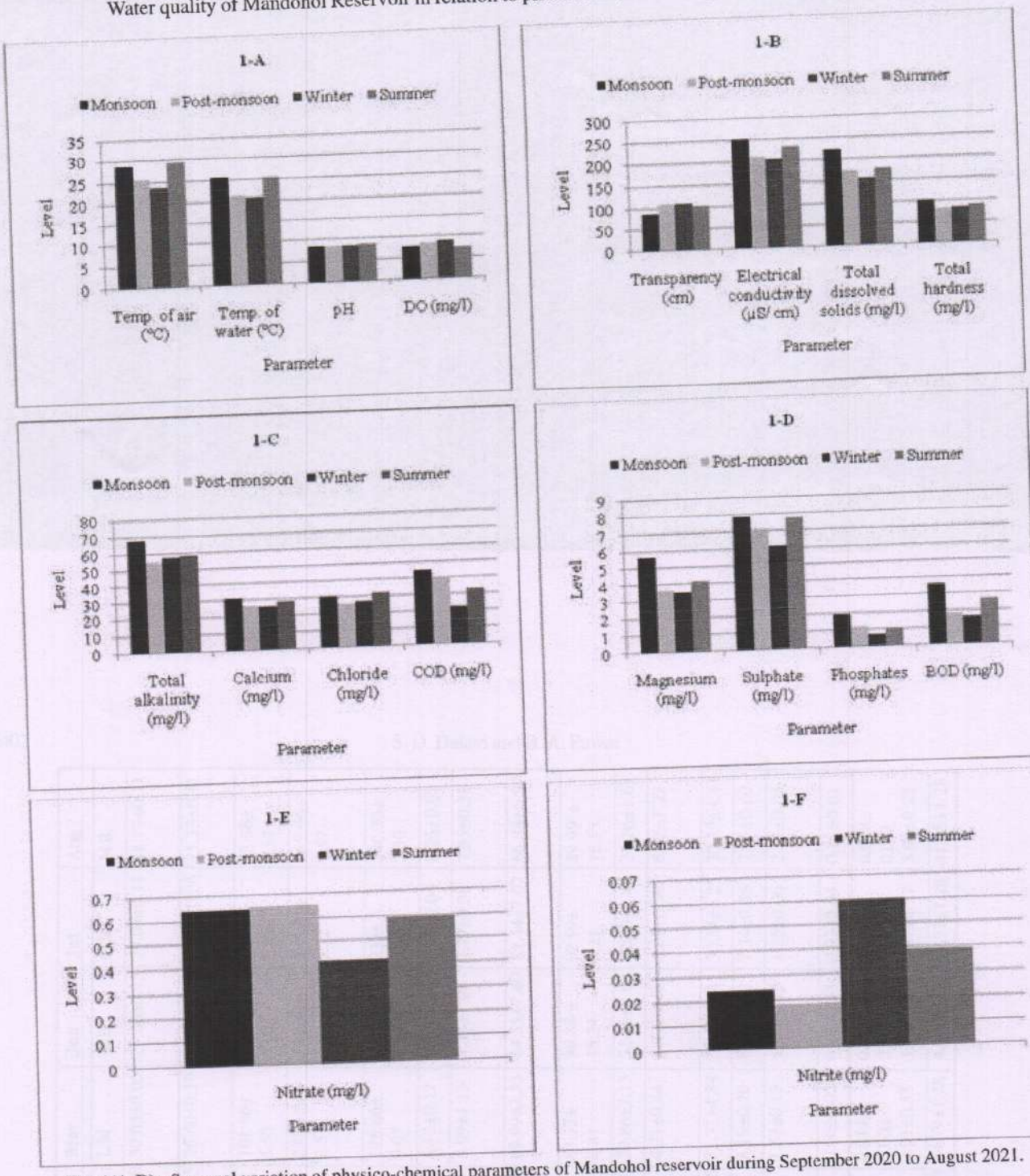


Fig. 1(A-D) : Seasonal variation of physico-chemical parameters of Mandohol reservoir during September 2020 to August 2021.

may be due to the increased solubility of oxygen at lower temperature.

Pond waters with an alkalinity less than 20 mg/l as $CaC0_3$ have a very low buffering capacity and consequently are vulnerable to fluctuations in pH, such fluctuations may be directly harmful to fish populations. Ponds with alkalinity greater than 300 mg/l may also be unproductive. The ideal range of total alkalinity for freshwater fish is 50-300 mg/l as $CaCO_3$. In the present investigation, Total Alkalinity ranged between 44.55 (March) to 82.44 mg/l (July). It was minimum (54.79 mg/l) during post-monsoon and maximum (67.44 mg/l) during monsoon.

Total hardness indicates water quality mainly in terms of Ca^{2+} and Mg^{2+} content. In the present investigation total hardness ranged between 64.44 (November) to 98.99

Table 1 : Monthly variation of physico-chemical parameters of Mandohol reservoir during September 2020 to August 2021.

S. no.	Parameters	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
1.	Water colour	GR	GR	CL	CL	CL	GR	GR	LM	LM	MB	MB	MB
2.	Air temperature (°C)	27.76±0.05	26.46±0.23	24.50±0.00	22.13±0.15	22.16±0.15	26.16±0.05	29.00±0.10	29.50±0.00	30.03±0.05	29.66±0.15	29.06±0.11	28.23±0.11
3.	Water temperature (°C)	24.13±0.05	21.33±0.05	21.06±0.11	19.40±0.00	20.13±0.05	22.93±0.05	23.56±0.05	25.36±0.05	26.60±0.10	26.13±0.23	25.83±0.06	25.33±0.11
4.	Transparency (cm)	91.16± 1.44	106± 3.60	113.66± 6.11	115.06± 10.46	110.66± 1.15	103.66± 2.88	106.66± 5.13	97.66± 1.52	101.66± 1.52	93.33± 3.05	84.66± 2.51	73.66± 0.57
5.	Electrical conductivity (µS/cm)	256.66 ± 10.69	211.33± 0.57	203± 4.35	202.33± 3.05	205± 2.00	202.33± 5.85	223.66± 2.88	227.66± 2.88	241.33± 2.51	231.33± 2.08	245.33± 4.72	262.66± 0.57
6.	Total dissolved solids (mg/l)	218.66± 1.52	180± 1.73	161.66± 3.78	140.66± 7.09	126 ± 56.29	162.66± 2.30	175± 3.46	177± 4.00	178.66± 9.07	191.66± 3.78	230± 2.64	240.33± 2.30
7.	pH	8.12±0.01	8.53±0.00	8.41±0.03	8.53±0.02	8.65±0.13	8.45±0.24	8.43±0.01	8.54±0.03	8.72±0.12	8.92±0.06	8.61±0.04	8.26±0.02
8.	Dissolved oxygen (mg/l)	7.98±0.68	8.22±0.38	8.44±0.38	9.10±0.38	9.33±0.00	8.00±0.00	8.22±0.38	7.77±0.38	5.99±1.15	7.33±1.08	7.77±0.38	7.55±0.38
9.	Total alkalinity (mg/l)	53.44± 3.16	56.58±0.92	48.05±1.73	65.77±4.23	58.88±5.09	44.55±1.83	45.55±5.09	46.77±3.50	69.99±3.33	64.55±7.60	82.44±7.07	66.88±5.97
10.	Total hardness (mg/l)	79.99± 21.86	74.72± 15.28	64.44 ± 12.61	64.66± 5.45	75.55± 13.87	73.44 ± 25.84	71.11 ± 20.09	75.66 ± 23.46	83.33± 8.81	89.88 ± 15.24	98.99± 8.21	89.99 ± 18.55
11.	Calcium (mg/l)	29.40±3.70	27.06±2.14	23.27±0.77	20.11±2.24	27.53±2.14	28.93±0.80	27.53±2.14	28.00±2.80	29.86±2.13	31.26±1.61	32.20±1.40	31.26±1.61
12.	Magnesium (mg/l)	5.083±0.44	4.34±0.48	2.92±0.49	3.21±0.45	3.78±0.51	3.51±0.56	4.03±1.32	4.24±0.46	4.21±0.44	5.27±0.46	6.02±0.39	6.02±1.22
13.	Chloride (mg/l)	25.62±0.53	25.63±2.09	24.92±2.28	26.96±7.66	24.98±0.58	25.29±0.96	31.06±4.99	33.09±1.16	31.71±4.84	33.43±4.41	30.34±6.25	30.39±4.41
14.	Sulphate (mg/l)	7.49±0.07	6.92±0.55	7.24±0.14	6.48±0.35	5.43±0.18	6.76±0.58	7.50±0.59	7.52±0.75	8.19±0.20	8.85±0.12	7.74±0.46	7.25±0.60
15.	Phosphates (mg/l)	2.39±0.17	1.47±0.31	0.80±1.35	0.40±0.00	0.72±0.03	0.90±0.02	0.51±0.08	1.11±0.19	1.53±0.15	1.67±0.05	1.35±0.06	2.17±0.05
16.	Nitrate (mg/l)	0.74±0.02	0.62±0.02	0.69± 0.02	0.46±0.03	0.32±0.02	0.50±0.01	0.56±0.02	0.63±0.03	0.60±0.02	0.73±0.03	0.93±0.04	0.18±0.01
17.	Nitrite (mg/l)	0.020± 0.00	0.015± 0.003	0.011± 0.001	0.011± 0.002	0.076± 0.001	0.091± 0.002	0.015± 0.004	0.089± 0.003	0.014± 0.000	0.021± 0.001	0.024± 0.001	0.028± 0.001
18.	BOD (mg/l)	3.45±0.54	1.92±0.59	1.70±0.60	1.01±0.07	1.80±0.33	2.07±0.24	2.09±0.17	2.93±0.30	2.91±0.53	3.39±0.39	3.57±0.57	3.96±0.23
19.	COD (mg/l)	40.71±1.28	43.67±1.28	36.64±1.28	19.98±1.28	20.78±1.28	25.55±1.28	32.57±1.28	30.35±1.28	34.79±1.28	44.78±1.28	49.92±1.28	41.45±1.28

All values are expressed as mean±S.D. (GR- Greenish; CL- Clear; LM- Light muddy; MB- Muddy brown).

mg/l (July). It was minimum (78.44 mg/l) during post-monsoon and maximum (100.8 mg/l) during monsoon. Sawyer (1960) stated that reservoir water is moderately hard as total hardness ranges between 76-150 mg/l.

Calcium is an important nutrient for aquatic organisms. The calcium level in the reservoir ranged between 20.11 (December) to 32.20 mg/l (July). It was minimum (25.52 mg/l) during winter and maximum (31.03 mg/l) during monsoon.

Magnesium ranged between 2.92 (November) and 6.02 mg/l (July-August). It was minimum (3.5 mg/l) during winter and maximum (5.59 mg/l) during monsoon.

The chlorides control the salinity of water and osmotic stress on biotic communities (Banerjee, 1967). Chloride ranged between 24.92 (November) to 33.43 mg/l (June). It was minimum (25.27 mg/l) during post-monsoon and maximum (31.95 mg/l) during summer. The maximum chloride value was recorded in summer, might be due to decrease in the volume of water by evaporation (Vikal and Tyagi, 2007).

Sulphate varied from 5.43 (January) to 8.85 mg/l (June). It was minimum (6.11 mg/l) during winter and maximum (7.83 mg/l) during monsoon. Similar results were also reported by Aher *et al* (2007) from Kagdipura swamp.

Phosphates are the key factor for the eutrophication of the lakes and are mainly contributed through anthropogenic sources such as sewage, agricultural run-off and run-off from unsewered residential areas. Phosphate ranged between 0.4 (December) to 2.39 mg/l (September). It was minimum (0.67 mg/l) during winter and maximum (1.91 mg/l) during monsoon. High level of phosphate during monsoon might be due to influx through rain water (Munawar, 1970).

Decomposition of organic matter is the main source of nitrate in the water bodies. Unpolluted natural water contains usually small amount of nitrate (Shinde, 2010). Nitrate ranged between 0.18 (August) to 0.93 mg/l (July). It was minimum (0.42 mg/l) during winter and maximum (0.65 mg/l) during post-monsoon.

Nitrite ranged between 0.011 (November-December) to 0.091 mg/l (February). It was minimum (0.018 mg/l) during post-monsoon and maximum (0.06 mg/l) during winter.

BOD is the measure of degradable organic matter present in water. The BOD and other microbial activities are generally increased by the introduction of sewage (Hynes, 1970). In the present study BOD varied from 1.01 (December) to 3.96 mg/l (August). It was minimum (1.62 mg/l) during winter and maximum (3.59 mg/l) during monsoon. Lower values of BOD indicate the lower consumption of oxygen and lower population load in the pond water.

COD ranged between 19.98 (December) to 49.92 mg/l (July). It was minimum (22.10 mg/l) during winter and maximum (44.21 mg/l) during monsoon.

The comparison of the water quality of Mandohol reservoir with limits laid down by fresh water quality criteria for fish and fisheries practices (Chandra Prakash, 2001) suggested that, the reservoir water may be considered suitable for fish culture as the seasonal fluctuations in water colour, electrical conductivity, total dissolved solids, pH, dissolved oxygen, total alkalinity and hardness, nitrate, nitrite, BOD and COD in all the seasons and temperature during monsoon and summer and chloride during summer are within the desirable limits for fish and fisheries practices. However, somewhat low level of calcium, magnesium and sulphate in all seasons and water temperature during post-monsoon to winter, and high level of transparency and phosphates in all the seasons were recorded. These parameters need to be modifying in order to favors the fish culture.

It was found that the Mandohol reservoir was suffering from the domestic type of pollution Hence, it is suggested that reservoir in some extent should be protected from the anthropogenic activities for preventing further deterioration in the water quality. Some of the measures, which demand immediate attention, are the : 1) Treatment of sewage and agricultural waste from surrounding, 2) An improved management and waste disposal programme should be initiated and 3) Change the farming practice in order to reduce the non-point pollutants from this source. Organic farming in these catchment areas may be encouraged.

ACKNOWLEDGEMENTS

Authors are thankful to the Principal, P.V.P. College, Pravaranagar for providing requisite facilities for completion of this work.

REFERENCES

Aher S K, Mane U H and Pawar B A (2007) A study on physico-chemical parameters of Kagdipura swamp in relation to pisciculture, near Aurangabad, Maharashtra. *J. Aqua. Biol.* **22**(1), 93-96.

APHA/AWWA/WEF (2017) Standard Methods for the Examination of Water and Wastewater. American Public Health Association, American Water Works Association, Water Environment Federation, Denver.

Banerjee S M (1967) Water quality and soil conditions of ponds in some states of India in relation to fish production. *Indian J. Fish.* **14**, 115-144.

Bawane V and Jadhav M (2013) Studies on some abiotic and biotic factors of Bhatana water reservoir, Maharashtra, India. *J. Exp. Zool. India* **16**(1), 135-137.

Bedwal S and Mathur R N (2015) Study of physico-chemical characteristic of Kisangarh lake, Ajmer for its sustainable management. *J. Exp. Zool. India* **18**(2), 751-754.

Biswas P, Vardia H K, Ghosh A and Biswas P (2012) Water quality of Budha Talab, Chhattisgarh. *J. Inland Fish. Soc. India* **44**(1), 94-97.

Chandra Prakash (2001) *Status of soil and water quality parameters in brood stalk management.* Course manual, CAS Training programme on Brood stock Management and Genetic selection in Fish seed production, CIFE, Mumbai. 73.

Devi Prasad A G, Venkataramana G V and Thomas M (2009) Fish diversity and its conservation in major wetlands of Mysore. *J. Environ. Biol.* **30**(5), 713-718.

George J P (1997) Aquatic ecosystem: Structure, degradation and strategies for management. Recent advances in ecological research, A.P.H. Publishing House, New Delhi, pp.603.

Golterman H L, Chlymo, R S and Ohanstand M A M (1978) *Methods for physical and chemical analysis of fresh water.* IBP Handbook No. 8, Backwell Scientific Pub. Oxford, London, Edinburgh, Melbourne, Second edn. pp. 172-178.

Hidaka H and Tatsukawa R (1985) Avoidance test of a fish, medaka (*Oryzias latipes*) to aquatic contaminants, with special reference to monochlorammine. *Arch. Environ. Contam.Toxicol.* **14**, 564-571.

Hynes B B N (1970) *The ecology of running waters.* Liverpool University Press, Liverpool.

Iwama G K, Vijayan M M and Morgan J D (2000) *The Stress Response in Fish.* Ichthyology, Recent Research Advances. Oxford and IBH Publishing Co, Pvt. Ltd, New Delhi.

Kadam M S, Pampatwar D V and Mali R P (2007) Seasonal variations in different physico-chemical characteristics in Masoli reservoir of Parbhani district, Maharashtra. *J. Aqua. Biol.* **22**(2), 110-112.

Kamal D, Khan A N, Rehman M A and Ahamed F (2007) Study on the physico-chemical properties of water of Mouri river, Khulna, Bangladesh. *Pak. J. Biol. Sci.* **10**(5), 710-717.

Kumar S, Jain V and Raghuvanshi S K (2021) Physico-chemical characteristics of Akshar Vihar pond in Bareilly, U.P. *Int. J. Adv. Res. Biol. Sci.* **8**(3), 30-36.

Kumar S, Jain S and Singh D P (2022) Seasonal variations in Physico-chemical parameters of Maan stream, Himachal Pradesh, India. *J. Exp. Zool. India* **25**(1), 539-546.

Lokhande D V and Pawar B A (2018) Water quality of Nathsagar reservoir in relation to fish culture, Aurangabad district, Maharashtra. *J. Exp. Zool. India* **21**(1), 337-340.

Mondal A, Anupama R R, Chakraborty S, Sattyanarayana B and Rout S K (2017) Application of water quality index in assessing Baigul reservoir ecosystem, Uttarakhand, India. *Biochem. Cell. Arch.* **17**(2), 457-462.

Munawar M (1970) Limnological studies on freshwater ponds of Hyderabad, India. *Hydrobiologia* **36**, 105-128.

Nooralam M D, Saw K and Mishra S K (2009) Preliminary study of physic-chemical characteristics of a perennial freshwater pond. *Flora and Fauna* **15**(1), 77-82.

Pawar B A and Pandarkar A K (2011) Studies on water quality of Kelewadi lake in relation to Pisciculture, Maharashtra. *Uttar Pradesh J. Zool.* **31**(1), 35-41.

Pawar B A, Dagale R D and Ghule K K (2018) Studies on water quality of Shilvandi lake with reference to fish culture, Ahmednagar district, Maharashtra. *J. Exp. Zool. India* **21**(2), 1073-1076.

Ranjan G, Mohan R and Singh N P (2008) Physico-chemical characteristics of a lentic water body of Birganj (Nepal) in relation to growth of zooplankton and fish culture. *Flora and Fauna* **14**(1), 65-68.

Sawyer C H (1960) *Chemistry for sanitary Engineers.* McGraw Hill Book Company, New York, USA.

Sharma L L and Gupta M C (1994) Some aspects of limnology of Awarchand reservoir, Rajasthan. Physical parameters. *Pollut. Res.* **13**, 16-19.

Shinde S E, Pathan T S, Raut K S, More P R and Sonawane D L (2010) Seasonal variations in Physico-chemical charateristics of Harsool - Savangi Dam, Dist. Aurangabad, India. *The Ecoscan (NEA)* **4**(1), 37-44.

Singh S, Inamdar S, Mitchell M and McHale P (2014) Seasonal pattern of dissolved organic matter (DOM) in watershed sources: Influence of hydrologic flow paths and autumn leaf fall. *Biogeochemistry* **118**, 321-337.

Srivastava U K and Reddy M D (1983) *Fisheries Development in India* - some aspects of policy management. Concept Publishing Co., New Delhi. pp 606.

Swingle H S (1967) Standardization of chemical analysis for water and pond mud. *FAO Fish. Rep.* **44**(4), 397-421.

Tarzwell C M (1957) Water quality criteria for aquatic life. In : *Biological problems in water pollution.* (ed. O S). Dept of Health Education and Welfare. P.H.S. pp. 246-272.

Usha R, Ramalingam K and Bharathirajan U D (2006) Freshwater lakes - A potential source for aquaculture activities - A model study on Perumal lake, Cuddalore, Tamil Nadu. *J. Environ. Biol.* **27**(4), 713-722.

Vikal P and Tyagi S (2007) Assessment of water quality of lake Pichhola before and after rains in August, 2005 in Udaipur, Rajasthan (India). *Poll. Res.* **26**(2), 249-252.

Vikhe V K and Pawar B A (2016) Studies on water quality of Adhala lake in relation to fish culture, Ahmednagar district, Maharashtra. *J. Exp. Zool. India* **19**(2), 821-824.

Wesleyan Journal of Research, Vol 15 No 01 (August 2022)

ISSN – 0975-1386

Research article: (Botany)

Effect of gamma irradiation on seed germination, seedling growth and morphological characteristics of Pisum sativum L.

Zaware R.P. [1], Aher R.K. [1] Bhusare B.P.[2]

[1]Department of Botany, New Arts, Commerce and Science College, Parner, Ahmednagar, MH, India

[2]Department of Biology, (IIB)-PCB, Nanded - 431605, M.S., India

Abstract

Pisum sativum L.(Family: Fabaceae), generally referred to be green pea else garden pea, has been beneficial dietary component since long back considering its fiber content, protein content, starch, trace elements, as well as numerous phytochemical substances. The ongoing research was executed to evaluate the effects of gamma radiation in reference to seeds germination, seedling growth, as well as morphological characters of Pisum sativum. For this, the dried and healthy seeds of Pisum sativum L. exposed to a gamma source at diferent doses (5kR, 10kR: 15kR, 20kR, 25kR, and 30kR). Our results found the significant differences in different morphological characters namely percentage seed germination, seedling survival, plant height, number of pods per plant, seedling length, flowering period, together with number of seeds per pod. Best result happened to be found, when the seeds were irradiated with 10kR dose when compared with control. While 30 kR found to be the most harmful radiation. Adverse effect on these parameters were observed by increasing the irradiation dose. Furthermore, 15 kR treatment was identified as a lethal dose (LD-50) because it prevented 50% germination in almost all evaluated genotypes. This research demonstrates that low dose gamma radiation can improve some Pisum sativum seedling development and germination rates during the early seedling stage.

Keywords: Gamma rays, Germination, LD-50, Pisum sativum L

Article History

* Received: 26/08/2022; *Accepted: 31/08/2022

1. Introduction

Amongst all, the most common as well as historically used cultivars of legumes is Pisum sativum L., often called as green pea, yellow pea, snow pea, sugar snap pea, or garden pea (Fahim et al. 2019). The second-largest significant grain legume alongwith one of the most common green vegetables around the globe is the pea (Pisum sativum L.), a cool-season legume crop cultivated in addition to 85 nations (Pandey et al. 2021). Although the Mediterranean region, the Near East, alongwith northeast Africa as well as southwest Asia, is where this annual herbaceous vine originally emerged, several species of pea are currently farmed around the world as one of the main winter vegetable crops (Fahim et al. 2019). Between 1999 (1.5 mh; 11.39 metric tonnes) and 2019 (2.8 mh; 21.76 metric tonnes), the global area as well as production of green peas nearly doubled (FAO FAOSTAT. 2019. 2021). Peas have a high carbohydrate content of 30–48%, a low fat content of 0.5–4.0%, and a high protein content of 20–35% (García Arteaga et al. 2021). Since long time, Significant interest has been shown in the phytochemical composition of pea plants, and a wide range of phenolic principles, together with flavonoids, isoflavonoids, phenolic acids, in addition to other minor phenolics as well as phytoalexins, came to be identified (Bian et al. 2015). Recently, researchers have looked at how these important metabolites affect the biological potential as well as health effects of pea (Jeyaraj et al. 2021).

Gregor Johann Mendel, the one that published the findings of pea (Pisum sativum L.) crossing

experiments during 1865, is rightfully credited with discovering genetics (Sinjushin et al. 2022). Although the general timeline of the above events is generally familiar, it must clarify that Mendel was not the one to cause mutation.. After this many scientist did mutation studies on pea and several morphological mutations have been familiar in pea (PGene 2022), out of those several of them tend to be confined on a genetic map. The majority of the above provide useful information for analysing the regulatory processes governing traits like floral monosymmetry, complex leaves, or symbiotic nitrogen fixation. Several of the above were as well as still are standard linkage mapping markers (Smýkal et al. 2022). The pea is still an important crop species and is among the most important in temperate climate zones, despite being a model organism for genetics and physiology. Thus, unique (or, opposed to, familiar) heritable morphological aberrations might be regarded as the origin of beneficial traits for continued crop improvement (Sinjushin et al. 2022).

An electromagnetic wave known as a gamma ray emits ionising radiation that causes biological consequences like cell death, stimulation, inhibition, and mutation (Mehdipour et al. 2021). Numerous researchers from around the world have reported on the impact of gamma radiation on crop productivity (Kato et al. 2020). These mutations bring useful diversity for practical plant breeding purposes. Induced mutations in plant biology are important for generating genetic variability in large scale crops. The technology is understandable, comparatively inexpensive to operate, as well as small and widely applicable (Awan et al. 2021).

Taking into account the aforementioned information, a test was performed to establish the proper acute gamma radiation dosages for obtaining the increased frequency of mutations that would be employed as a source of variability.

2. Materials and Methods

2.1. Seeds Collection

Dried as well as healthy seeds of the local variety (Ap3) of Pisum sativum L. were collected from the Hareshwar Krushi Sheva Kandra Agricultural Clinic, Takali Dhokeshwar.

2.2. Treatment of Gamma radiation and LD 50 value

Seeds was exposed to various dosages regarding gamma rays such as (5, 10, 15, 20, 25, 30, 35, 40 as well as 50kR).Treatment was conducted in the Department of Biophysics, Government Institute of Science Aurangabad. Irradiated seeds were sown in nursery trays for first experiment. In second experiment the irradiated seeds were directly sown in field. First experiment conducted especially to count the seedling length. After irradiation, 100 seeds of each dose were planted in a nursery tray, 100 seeds per tray. The seed was then tested for germination. The LD_{50} value was determined with a germination reduction of 50 percent.

2.3. Field experiment

Treated seeds were planted in the field during the 2019-20 rabbi season. The seeds were sown at a depth of 4-5 centimeter in rows and planted at a distance of 30 centimeter.

2.4. Expermental Design and Data collection

A randomized block design comprising of three replicates was assigned for test. In first experiment (tray expt.) the five plant select randomly and data was recorded in terms of Seed germination percentage, Seedling height as well as Seedling vigour index at 15thday after sowing in trays. While in second experiment (Field expt.), five plant select randomly and data was recorded in terms of Seed germination percentage, plant height (centimeter), Seedling survival (%) flowering time (days), number of pods per plant, pod length (centimeter), as well as number of seeds per pod. Seed germination percentage, Seedling height as well as Seedling vigour index was recorded at 15thday after sowing in trays. Seed germinatination %, Seedling survival (%) and Seedling vigour index calculated by following formulas

i) Seed germination (%) = Number of seed germinated/ total number of seeds× 100

ii) Seedling vigour index = Seed germination (%) × seedling height

iii) Seedling survival (%) = Number of seed survived/ Number of seed germinated× 100

3. Results and discussion

3.1. Effect of gamma radiation against seed germination as well as seedling growth (Nursery tray experiment)

In the first experiment, highest percentage of germination (98%) was seen in the control and lowest was observed (30%) in the 30 kR gamma irradiation treatment (Table 1; Fig 1). The percentage of seed germination got reduced when the seed treated alongside various dosages of gamma-rays. In case of radition treatment maximum seedling length was observed (24.8 centimeter) in 10 kR treatment of gamma radiation (Table 1;Fig 1). When the treatment doses was increases from 15 kR to 30 kR, decrease in seedling length (20 centimeter-12.7 centimeter) was seen. In control, 23.9 centimeter of seedling length was noted. Regarding seedling vigour index, the control found to be maximum (2342.2) while in treated seeds, 10 kR shown highest (2306.4) seedling vigour index but not more than control. When the concentration of gamma doses increases the decrease in seedling vigour index was recorded (Table 1;Fig 1). The present data showed that, an adverse impact on seed germination was evidently seen in pea after the mutagenic treatments. From lower to higher dosages of mutagenic treatments, there was a gradual decrease in germination. Similar types results were proposed through (Datir et. al., 2007) regarding horsegram and (Potdukhe and Narkhede., 2002) regarding pigeon pea which supports our findings.

Table 1. Effect of gamma irradiation against seed germination as well as seedling characters in pea

Gamma rays Dosages	Total seeds sown	Seed germination (%)	Seedling length (centimeter)	Seedling vigour index
Control	100	98	23.9	2342.2
05 kR	100	92	19.85	1826.2
10 kR	100	93	24.8	2306.4
15 kR	100	51	20	1020
20 kR	100	40	17.3	692
25 kR	100	36	14.7	529.2
30 kR	100	30	12.7	381

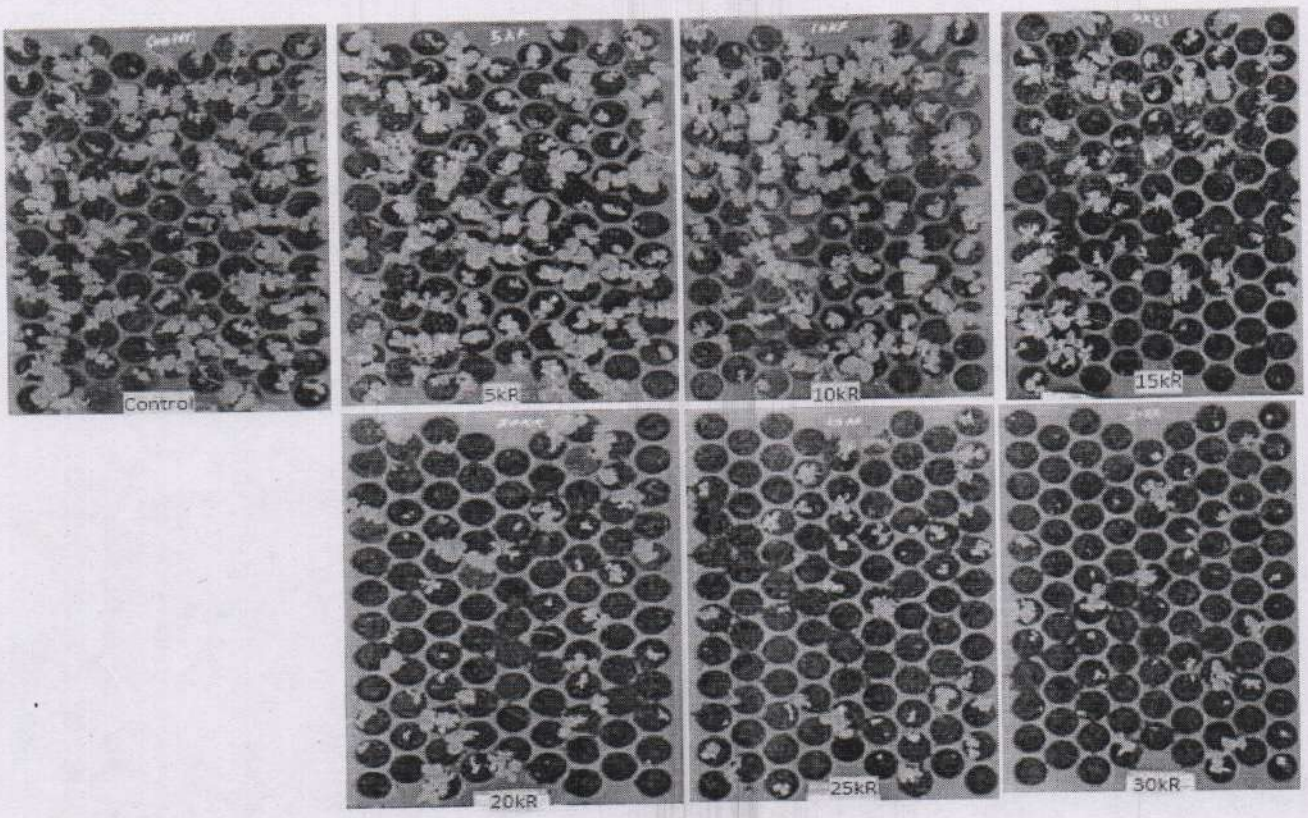


Fig. 1. Effect of gamma irradiation against seed germination (Nursery tray expt.)

3.2. Effect of gamma radiation against seed germination as well as morphological characteristics (field experiment)

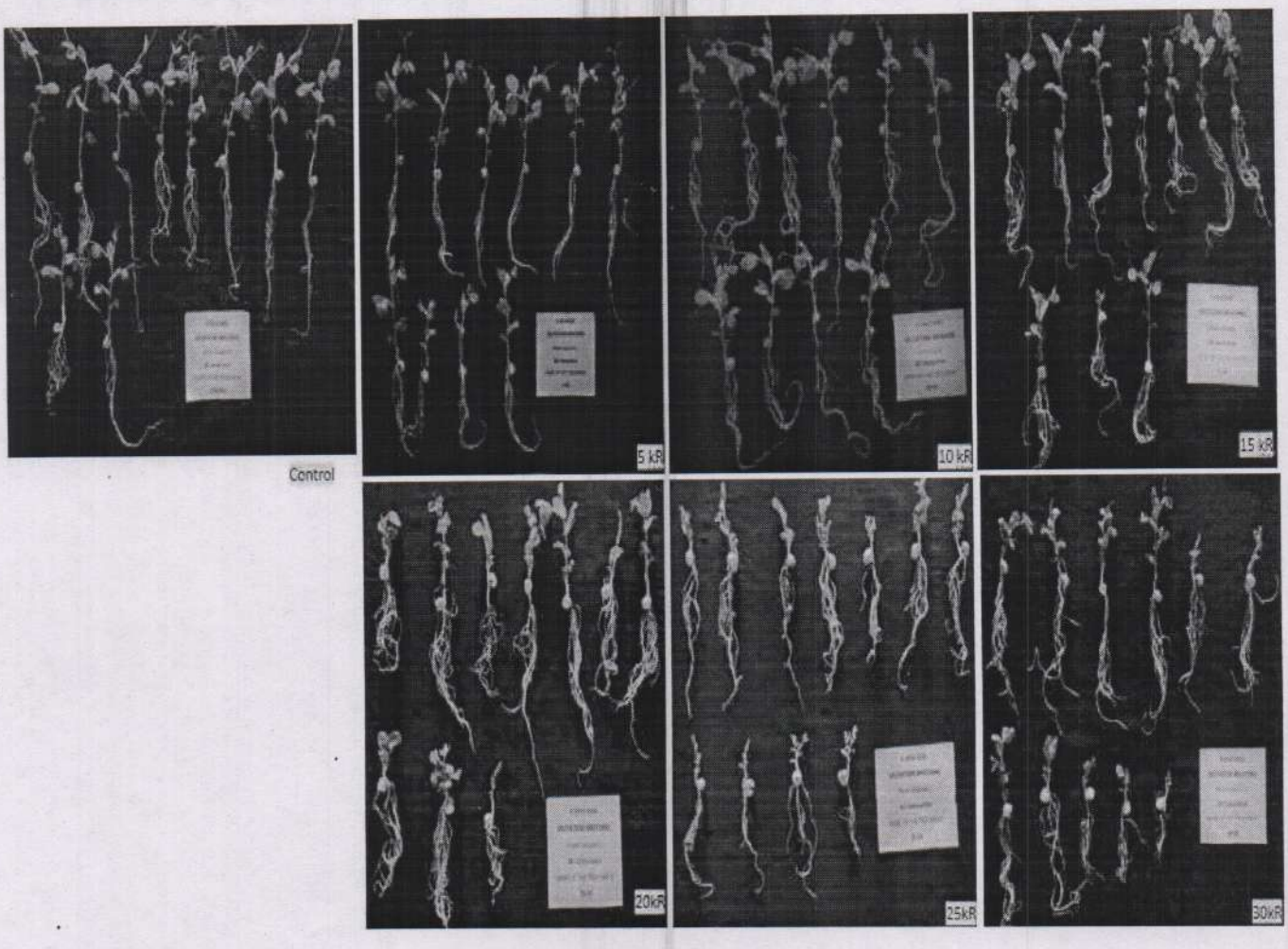
In the field experiment, Seed germination percentage, plant height (centimeter), Seedling survival (%) flowering time (days), number of pods / plant, pod length (centimeter), as well as number of seeds/ pod were considered for analyzing the gamma radiation effect. Highest percentage of seed germination (78%) was seen in the 10 kR treatment and lowest was observed (16%) in the 30 kR gamma irradiation treatment (Table 2; Fig. 2). In control, 75% of seed germination was recorded. The percentage of seed germination got reduced when the seed treated alongside various dosages of gamma-rays. The influence of mutagens on the seed's meristematic tissues might have resulted in a percentage reduction in seed germination. Seed germination may be affected by alterations at the cellular level (induced by physiological (or) physical factors) at greater mutagen doses/concentrations. Similar type of results were reported by Kumar and Mishra (2004) in okra.

In case of radition treatment, highest seed survival percentage (88%) was observed in 25 kR treatment while in control, 77.3% seed survival percentage was seen (Table 2; Fig. 2). 54.5% of seed survival percentage was seen in 15 kR treatment which was lowest whwn compared with control and other treatments. Decrease in the survival rate of the seedlings with increasing concentrations of mutagenic treatment was reported the Auti (2012) in mungbean. In case of plant height, maximum heigh (41 centimeter) was recorded in 20 kR treatment which was highest when compared with control and other treatment. However, in similar treatment flowering took maximum time (49 days) when compared with control and other treatment. In 15 kR treatment, 7.5 number of pods were found which is highest while 25 kR found to be best treatment for pod length (7.8 centimeter), when compared with control and other treatment (Table 2; Fig. 2). Mutagenic treatment foun to be best at some extent, higher doses of mutagenic treatment showed negative effects on plant morphological charactristics (Bhusare et al. 2021).

Table 2. Effect of gamma irradiation against seed germination as well as morphological characters of P. sativum L.

Gamma rays Dosages	Total seeds sown	Seed germination (%)	Seedling survival percentage (%)	Plant height (centi meter)	Days to Flowering (Days)	Seeds Number/ pod	Pods Number/ plant	Pod length (centimeter)
Control	100	75	77.3	35.5	44.8	6.5	5.6	4.5
05 kR	100	70	70	26.6	42	6.4	5.6	5.6
10 kR	100	78	67.9	35	43	5.5	6.6	5.5
15 kR	100	55	54.5	35	45	6.2	7.5	5.8
20 kR	100	30	56.6	41	49	5.8	5.5	6.5
25 kR	100	25	88	39	45	7.5	6.5	7.8
30 kR	100	16	68.7	36	50	6.5	5.6	6.0

Fig. 2. Effect of gamma irradiation against seedling growth as well as morphological characteristics of P. sativum L.



4. Conclusions

The findings of this investigation indicated that gamma radiation may have a dose-dependent impact on the germination, growth, and morphological characteristics of seeds. Low gamma dosages stimulated the morphological features, as was seen. High radiation doses, however, reduced the germination of seeds, plant development, and other morphological characteristics. Additionally, it was determined that biological consequences of ionising radiation stress, such as negative ones that could

increase radiosensitivity and alter plant growth, physiological functioning, and biochemistry.

5. References

1. Auti, S.G., 2012. Induced morphological and quantitative mutations in mungbean. Bioremediation, Biodiversity and Bioavailability, 6(1), 27-39.
2. Awan FS, Sadia B, Altaf J, Habib M, Hameed K, Hussain S., 2021. Genetic Variability through Induced Mutation. In Genetic Variation 2021 May 19. Intech Open.
3. Bhusare BP, John CK, Bhatt VP, Nikam TD., 2021. Colchicine induces tetraploids in in vitro cultures of Digitalis lanata Ehrh.: Enhanced production of biomass and cardiac glycosides. Industrial Crops and Products. 15;174:114167.
4. Bian ZH, Yang QC, Liu WK., 2015. Effects of light quality on the accumulation of phytochemicals in vegetables produced in controlled environments: a review. Journal of the Science of Food and Agriculture. 2015 Mar 30;95(5):869-77.
5. Datir SS, Dhumal KN, Pandey RN., 2007. Gamma radiation and EMS induced variation seed germination and plant survival in horse gram (Macrotyloma uniflorum (Lam.) Verdc). J Arid Legumes.;4(1):15-17.
6. Fahim, J.R., Attia, E.Z. & Kamel, M.S., 2019. The phenolic profile of pea (Pisum sativum): a phytochemical and pharmacological overview. Phytochem Rev 18, 173–198 (2019).
7. FAO FAOSTAT. 2019. 2021. Available online: http://www.fao.org/faostat/en/#home (accessed on 12 April 2021).
8. García Arteaga V, Kraus S, Schott M, Muranyi I, Schweiggert-Weisz U, Eisner P., 2021. Screening of twelve pea (Pisum sativum L.) cultivars and their isolates focusing on the protein characterization, functionality, and sensory profiles. Foods. 2021 Apr;10(4):758.
9. Jeyaraj EJ, Lim YY, Choo WS., 2021. Extraction methods of butterfly pea (Clitoria ternatea) flower and biological activities of its phytochemicals. Journal of food science and technology. 2021 Jun;58(6):2054-67.
10. Kato H, Li F, Shimizu A., 2020. The selection of gamma-ray irradiated higher yield rice mutants by directed evolution method. Plants. 2020 Aug;9(8):1004.
11. Kumar, A., Mishra, M.N., 2004.Effect of gamma rays, EMS and NMU on germination, seedling vigour,pollen viability and plant survival in M1andM2generation of Okra (Abelmoschus esculentus (L.) Moench). Adv.PlantSci.17(1),295-297.
12. Mehdipour A, Yousefi-Ahmadipour A, Kennedy D, Arababadi MK., 2021. Ionizing radiation and toll like receptors: a systematic review article. Human Immunology. 2021 Jun 1;82(6):446-54.
13. Pandey, A.K., Rubiales, D., Wang, Y. et al., 2021. Omics resources and omics-enabled approaches for achieving high productivity and improved quality in pea (Pisum sativum L.). Theor Appl Genet 134, 755–776 (2021).
14. PGene. Pisum Gene List., 2022. Available online: http://data.jic.ac.uk/pgene/ (accessed on 13 January 2022).
15. Potdukhe NR, Narkhede., 2002 MN. Induced mutations in Pigeon pea (Cajanus cajan L.) J Nuclear Agric Biol. 2002; 31(1):41-46.
16. Sinjushin A, Semenova E, Vishnyakova M., 2022. Usage of Morphological Mutations for Improvement of a Garden Pea (Pisum sativum): The Experience of Breeding in Russia. Agronomy. 2022 Feb 22;12(3):544.
17. Smykal, P.; Aubert, G.; Burstin, J.; Coyne, C.J.; Ellis, N.T.H.; Flavell, A.J.; Ford, R.; Hýbl, M.; Macas, J.; Neumann, P.; et al., Pea 2012. (Pisum sativum L.) in the genomic era. Agronomy 2012, 2, 74–115

3(A)

MAH MUL/03051/2012
ISSN: 2319 9318

Vidyawarta®
Peer-Reviewed International Journal

April To June 2021
Issue-38, Vol-04

01

आंतरविद्याशाखीय बहुभाषिक शोध पत्रिका

विद्यावार्ता

❖ **विद्यावार्ता** या आंतरविद्याशाखीय बहुभाषिक त्रैमासिकात व्यक्त झालेल्या मतांशी मालक, प्रकाशक, मुद्रक, संपादक सहमत असतीलच असे नाही. **न्यायक्षेत्र:बीड**

"Printed by: **Harshwardhan Publication Pvt.Ltd.** Published by **Ghodke Archana Rajendra** & Printed & published at Harshwardhan Publication Pvt.Ltd.,At.Post. Limbaganesh Dist,Beed -431122 (Maharashtra) and Editor **Dr. Gholap Bapu Ganpat.**

Reg.No.U74120 MH2013 PTC 251205

Harshwardhan Publication Pvt.Ltd.
At.Post.Limbaganesh,Tq.Dist.Beed
Pin-431126 (Maharashtra) Cell:07588057695,09850203295
harshwardhanpubli@gmail.com, vidyawarta@gmail.com

All Types Educational & Reference Book Publisher & Distributors / www.vidyawarta.com

डॉ. नीला दोवणकर
शोध निर्देशक
अध्यक्ष : हिंदी विभाग
आबासाहेब गरवारे महाविद्यालय, पुणे

डॉ. नीला बोर्वणकर
शोध निर्देशक
अध्यक्ष : हिंदी विभाग
आबासाहेब गरवारे महाविद्यालय, पुणे

83

अरण्य में सूरज : आदिवासी समस्याओं का समाजशास्त्रीय अध्ययन

एकनाथ गणपती जाधव
हिंदी विभाग,
श्री ढोकेश्वर कॉलेज, टाकली ढोकेश्वर, ता. पारनेर,
जि. अहमदनगर (महाराष्ट्र)

साहित्य समाज का दर्पण होता है। साहित्यकार समाज में रहने वाला व्यक्ति है । उनके साहित्य में परिवेश का लेखा–जोखा आना स्वभाविक है । बदलती परिस्थिति के अनुरूप समाज भी परिवर्तित होता है। आजादी के बाद भी हाशिए का समाज आज मुख्यधारा में नहीं आ पाया है। इसके कारण, दुष्परिणाम एवं विकास के लिए संभाव्य स्थिति को एक बुद्धिजीवी ,चिंतक अपनी रचना के माध्यम से अभिव्यक्त करता है। आदिवासी समाज आज भी संविधानिक मौलिक अधिकारों से कोसों दूर है।

भीलवाड़ा क्षेत्र के भील एवं अन्य जनजातियों की स्थिति एवं गति को प्रस्तुत उपन्यास में चित्रित किया है।

प्रस्तुत उपन्यास अजित गुप्ता द्वारा लिखित है। यह राजस्थान के मेवाड़ एवं आसपास रहने वाले जनजातियों पर केंद्रित है । ग्याहरवीं शती में मेवाड़ का नेतृत्व (राजा) करने वाली भील समाज की वर्तमान स्थिति को उपन्यास में चित्रित किया है। भीलवाड़ा समाज में रूढ़ी परंपरा से चली आ रही मौताना परंपरा की भयानकता को चित्रित किया है । मौताना परंपरा के शिकार हुए परिवार एवं पीढ़ियों तक उनके परिणाम को भुगतना पड़ता है । सोहना मौताना परंपरा का शिकार हुआ है । इस परंपरा के शिकार अन्य कोई परिवार एवं बच्चे न हो इसीलिए वह इसका बड़ा एवं शिक्षित होकर विरोध करता है। अपनी बहन लक्ष्मी की असमय मृत्यु होती है लक्ष्मण (पति) से वहां मौताना लेने से नकारता है। इस परंपरा की भयानकता को वह सभी को समझाता है।

प्रस्तुत उपन्यास में भीलवाड़ा आदिवासियों का शोषण सेठ, साहूकार, दिक्कूयों, होटल मालिक आदि द्वारा हुआ है। आदिवासियों की मजबूरी का फायदा उन्होंने लिया है। इन्हें काम पर तो मजूर चाहिए किंतु आदिवासियों पर उपकार दिखाते है ।सोहना एवं रामा प्रतिनिधि पात्र है। आदिवासी विकास के लिए अनेक योजना है। विकास कागजों पर है यप्रत्यक्ष मात्र शोषण, गरीबी है । उपन्यास में आदिवासियों का अधिक शोषण ही हुआ है जिसका दुष्परिणाम उनके जीवन पर हुआ है।

"... होटल के सेठ ने मेरे बदले पूरे पचास हजार रु. दिए है। मैं तो जिंदगी भर इनके झूठे बर्तन ही मांजुंगा। पृ.क्र.१८२

बाल मजदूरी, बाल विवाह, मौताना परंपरा के दुष्परिणाम उपन्यास में चित्रित है। भीलवाड़ा क्षेत्र के आदिवासियों के पास रोजगार की कोई अवसर नहीं है । परिवार की जिम्मेदारी को पूरा करने उन्हें रांची एवं अन्य शहरों में जाना पड़ता है । सोहना सेठ जी के यहां दुकान पर काम करता है। रामा एक होटल पर काम करता है। लड़कियां शहरों में आया बनकर काम करती हैं। गंगा के माता–पिता की सड़क दुर्घटना भी रोजगार की तलाश करते समय होती है। समय के साथ बदलती जीवन शैली एवं कानून (वन विभाग) नियम ने बेरोजगारी को अधिक बढ़ाया है

"एक दिन शहरों में मजदूरी करने जाते जाते समय बस घाटे में लुढ़क गई...."पृ.क्र.६३

भील समाज में शिक्षा का अभाव अनेक कारणों से है। गंगा जिस स्कूल में काम करती है। वहां के बच्चों की आर्थिक स्थिति दयनीय है । वह स्कूल आते हैं मात्र खाना लेने के लिए यसोहना स्कूल के लिए बच्चों के घर घर जाता है। पता चलता है घर पर काम करने वाला कोई नहीं है।मजूरी, बकरिया,छोटे भाई बहन को संभालना आदि कारण इनके स्कूल न आने के है । स्कूल में पढ़ते समय बच्चों का अनुभव विश्व पहाड़ी, पर्वत, जंगल होने के कारण किताबी

Jadhav

डॉ. नीला जाधव
शोध निदेशक
अध्यक्ष : हिंदी विभाग

विश्व को समझने ने दिक्कते है। दूसरी ओर सोना है वह पढ़ना चाहता है किंतु मजबूरी में सेठ जी के यहां नौकर का काम करता है।

"किसी को अपने बकरी चराने होती है ,किसी को अपने छोटे भाई बहन को रखना होता है। स्कूल जाए तो फिर घर कैसे चले?" पृ.क्र.१२६

धर्मांतरण, वन कायदा ,हिंसक संगठन, गरीबी ,पेट भरने की मजबूरी आदि कारणों से आदिवासियों को विस्थापन को स्वीकारना पड़ता है। उनके सामाजिक एवं सांस्कृतिक अस्तित्व को बचाने के लिए विस्थापन का मार्ग उन्हें अपनाना पड़ता है।

"धर्म बदलने से आदमी नहीं बदलता। उसकी समस्याएं नहीं बदलती।"पृ.क्र.११८

परमानंद जी के माध्यम से उपन्यास मे चित्रित पूर्वांचल राज्य की सामाजिक,आर्थिक स्थिती का वर्णन किया है। राजस्थान से व्यापार करणे आए, व्यापारी एवं स्थानिक लोगों की आर्थिक स्थिती मे बहुत अंतर है नक्षलवादी संघटन व्यापारी से लेवी वसूलते है। लोगों का इन संघटन को समर्थन मिलता है। पूर्वांचल राज्य की सामाजिक स्थिति को नक्षलवादी ने प्रभावित किया है ।

"...इतने आतंकवादी समूह को आखिर धन कहां से प्राप्त होता है ?....पृ.क्र.२३

भीलवाड़ा क्षेत्र के आदिवासियों में मोताना परंपरा का दुष्परिणाम, मजदूरी का अभाव,वन कानून आड में जंगल कट गया है । अस्पताल का खर्च अधिक है । लड़कों को परिवार की जिम्मेदारी समय से जल्दी आने से उनका बचपन खो गया है । भीलवाड़ा क्षेत्र के आदिवासियों की स्थिति दयनीय है । वे अपनी आवश्यकता को भी पूरा नहीं कर सकते है। सोहना,रामा बाल मजदूरी करते हैं । घर पर अनाज नहीं है,स्कूल जाने के लिए पैसा एवं समय नहीं है। यह मजबूरी मानव निर्मित एवं नैसर्गिक उन पर थोपी गई है यजिसका दुष्परिणाम उनके व्यक्तित्व पर हुआ है।

"दो दिन से मजदूरी नहीं....।"पृ.क्र.२६

उपन्यास में भील समाज दारू का उपयोग शादी ब्याह, आनंद उत्सव,भूख को भुलाने के लिए, आपसी नाराजी दूर करने के लिए, श्रम से थके शरीर को आराम दिलाने के लिए आदि प्रसंगों पर किया जाता है। अतीत में भील एक राजा था आज उसे याद कर वह गुस्से में आता है। नशा से भीलवाड़ा के आदिवासी गरीब से और गरीब बनता जा रहा है । उनके भावाविश्व एवं व्यवहार अपराधी वृत्ति की ओर उत्तेजित हो रहे है । यही समस्या उपन्यास में चित्रित है।

"यह शराब गरीब को और गरीब बना देती है । अपराधी बना देती है...।"पृ.क्र.११७

अत: कहा जा सकता है कि अरण्य में सूरज उपन्यास में चित्रित भीलवाड़ा क्षेत्र के आदिवासियों का जीवन अनेक समस्याओं से घिरा है। उसके कारण मानव निर्मित एवं नैसर्गिक है। विकास के नाम पर आदिवासियों के साथ मात्र छल हुआ है। उनकी इस स्थिति के जिम्मेदार प्रशासकीय कर्मचारी,नेता एवं समाज है। विकास के लिए जो अलग—अलग नीतियां बनती है उसे प्रामाणिक रूप से लागू करना एवं उन्हें मुख्यधारा में लाने का प्रयास करना अत्यंत आवश्यक है। संविधानिक अधिकार के लिए उन्हें प्रबोधन करना अत्यंत आवश्यक है। आदिवासी विकास योजना की खामियों में सुधार आवश्यक है। हाशिए पर के समाज को मुख्य धारा में लाने के लिए उपर्युक्त कार्य करना समय की मांग है।

आधार ग्रंथ

अरण्य में सूरज,अजीत गुप्ता,सामयिक प्रकाशन, नई दिल्ली, प्रथम संस्करण २००९

❑❑❑

डॉ. नीला बोर्वणकर
शोध निर्देशक
अध्यक्ष : हिंदी विभाग
आप्पासाहेब गरवारे महाविद्यालय, पुणे

Studies on Water Quality Index of Mandohol Rservoir, Ahmednagar District, Maharashtra

S. D. Dalavi and B. A. Pawar*
Department of Zoology, Shri Dhokeshwar College, Takali Dhokeshwar, Tal. Parner, Ahmednagar- 414 304, India.
*Department of Zoology, P.V.P. College, Pravaranagar, Tal. Rahata, Ahmednagar- 413 713, India.
E-mail: dalvi25592samir@gmail.com

Abstract :

The study assessed some physicochemical parameters and the overall water quality index (WQI) of the Mandohol reservoir during September 2020 to August 2021 to ascertain its suitability for purposes like drinking, irrigation, fishing, industrial use, etc. Water parameters viz., Temperature, electrical conductivity, total dissolved solids, pH, dissolved oxygen, total alkalinity, hardness, chloride, nitrate, nitrite, sulphate, phosphate, BOD and COD were assessed by using standard methods. The WQI for the reservoir was determined by Weighted Arithmetic Index method is 38.67068 (Grade- B). The mean observed values of studied parameters are less as compared with WHO, ICMR and BIS standards for drinking water quality indicate low level of water pollution and do not have eutrophication features. Reservoir water is suitable for the domestic, industrial and agricultural use including fish culture without any treatment but the proper treatment is required to use this water for drinking purpose.

Keyword's: Eutrophication, Mandohol Reservoir, Water quality index, Weighted Arithmetic method.

Introduction:

As a result of development in industrialization and urbanization, the need of freshwater has increased enormously. Simultaneously the release of domestic and industrial sewage, dumping of anthropogenic waste and encroachment are becoming the common serious problems of rivers, dams and wetlands. (Kumar and Sharma, 2014). With the increasing demand of freshwater sources around the world man has created new way of ensuring availability of freshwater resources by constructing dams on rivers (Ogbodo et al., 2020). A dam is an artificial barrier constructed on the river water for the purpose of domestic, irrigation, power generation and industrial water needs.

Mandohol reservoir is an anthropogenic water body constructed in the drought prone area of Parner tehsil. This reservoir is located (latitude 19°11'56"N and longitude 74°18'28"E) at Karjule Hareshwar in Parner taluka, Ahmednagar district, Maharashtra. It lies in the hilly region and is a rain fed freshwater body containing water throughout the year. The water of reservoir is supplied to nearby 73 villages through irrigation canal, pipelines and tankers. This dam is also a popular tourist destination because of attractive natural waterfalls. An uncontrolled tourist activities and non-biodegradable pollutants from nearby villages are altering the water quality. Hence, a regular monitoring of physico-chemical parameters was essential to determine status of water quality of this water body.

WQI was first developed by researcher Horton in the early 1970s, is a mathematical means of calculating a single value from multiple test results values (Horton, 1965). WQI is recommended by Central Pollution Control Board of the Govt. of India. It is the appropriate and

resourceful method for determining the water quality. WQI provides an extensive interpretation of the quality of water and its suitability for various purposes like drinking, irrigation, fishing, industrial use, etc. (Amadi, 2011).

Earlier studies on water quality index of different water bodies were determined by (Simoes et al., 2008; Yogendra & Puttaiah, 2008; Aware et al., 2013; Kumar et al., 2014; Ochuko et al., 2014; Pal et al., 2016; Dhere and Pondhe, 2017; Palit et al., 2018; Ogbodo et al., 2020). Present study aims to check and interpret the suitability of the dam water.

Materials and method :

Monthly water samples of Madohol reservoir were collected from three different sites in the morning between 9.30 a.m. to 11.30 a.m. during September 2020 to August 2021. The clean plastic bottles were used for sampling and samples were immediately brought to the laboratory for analysis. The Temperature, pH, TDS and Electrical conductivity were recorded on the field by Eutech PCS Tester 35, multi-parameter Singapore. Other parameters viz., DO and BOD by modified Winkler's method, alkalinity by titrimetric method, hardness, calcium and magnesium by EDTA titrimetric Method, chloride by Mohr's titration method, nitrate, nitrite, phosphate and sulphates by spectrophotometer (Elico, SI 171 mini-Spec) and COD by open reflux method were analysed on the same day in the laboratory (Golterman *et al,* 1978; APHA., 2017).

The WQI has been calculated by using the standards of drinking water quality recommended by the World Health Organisation (WHO), Bureau of Indian Standards (BIS) and Indian Council for Medical Research (ICMR). The weighted arithmetic index method has been used for the calculation of WQI of the water body. WQI is calculated with the help of weighted arithmetic index method (Brown et al. 1972). Statistical analysis was done using Microsoft excel 2010.

Water quality index is calculated using the equation:

$$\mathbf{WQI = \sum QnWn / \sum W} \quad \text{.....1}$$

The quality rating Qn is calculated by equation:

$$\mathbf{Qn = 100[(V_n - V_{i0}) / (S_n - V_{i0})]} \quad \text{..... 2}$$

Where, Vn is the estimated observed value of the parameter,

$\mathbf{V_{i0}}$ is the ideal value of parameter,

$\mathbf{[V_{i0} = 0}$, **except for pH** $\mathbf{(V_{i0} = 7)}$ **and DO** $\mathbf{(V_{i0} = 14.6\ mg/l)]}$,

$\mathbf{S_n}$ is the standard permissible value for the n^{th} water quality parameter.

Unit weight (**Wn**) is calculated using the formula:

$$\mathbf{Wn = k/S_n} \quad \text{..... 3}$$

Where, K is the constant of proportionality calculated using the equation:

$$\mathbf{K = 1/ (\sum 1/Sn)} \quad \text{..... 4}$$

Results and Discussion:

Water quality ratings as per weight arithmetic index method and possible use of water according to the level and grade is shown in the table 1. The comparison of mean observed values of physiochemical parameters and standard values prescribed by WHO, ICMR and BIS are compared along with their unit weight presented in table 2 and fig. 1. The calculation of WQI is shown in table 3.

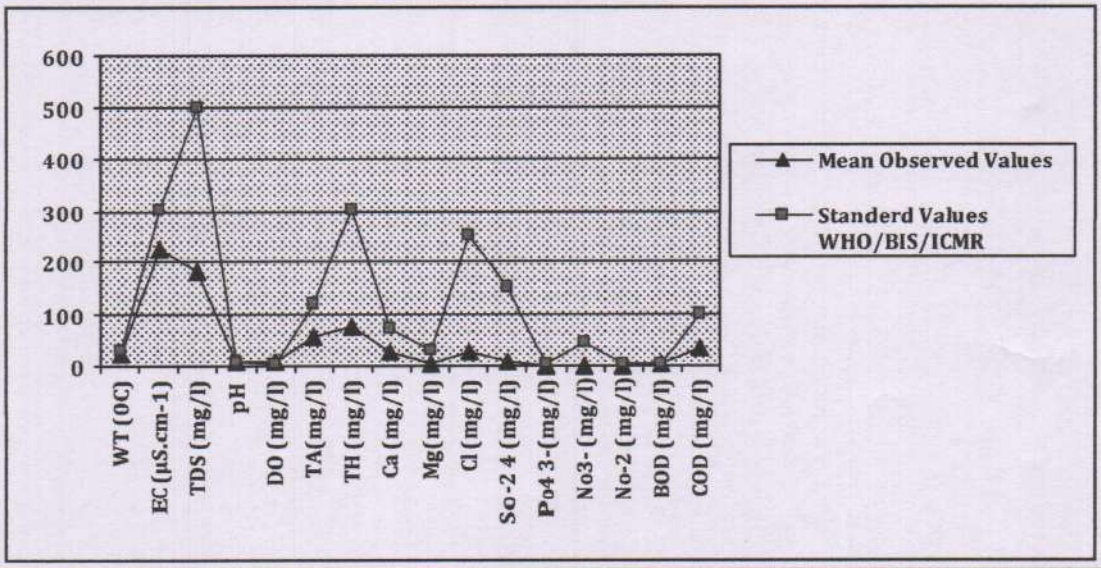
Table: 1 Water Quality Ratings as per Weighted Arithmetic Water Quality Index Method.

water quality index level	Grade	water quality status	Possible usage
0-25	A	Excellent	All-purpose like potable, industrial and agricultural.
26-50	B	Good	Domestic and agricultural.
51-75	C	Poor	Agricultural and industrial.
76-100	D	very poor	Agricultural.
>100	E	Unfit for drinking	Proper treatment required before use for drinking and fish culture.

Table 2: Mean Physico-chemical Parameters of Mandohol reservoir during September 2020 to August 2021 and Standard with their unit weight (Palit et al., 2018; Ogbodo et al., 2020).

Sr. No	Parameters	Recommended agency	Mean Observed values (Vn)	Standard Values (Sn)	Unit weight (Wn)
1.	Water temperature	WHO	23.48	30	0.027991
2.	Electrical conductivity	ICMR	226.05	300	0.002799
3.	Total dissolved solids	ICMR/BIS	181.85	500	0.001679
4.	pH	ICMR/BIS	8.51	8.5	0.098791
5.	Dissolved oxygen	ICMR/BIS	7.97	5	0.167945
6.	Total alkalinity	ICMR	58.62	120	0.006998
7.	Total hardness	ICMR/BIS	78.48	300	0.002799
8.	Calcium	ICMR/BIS	28.03	75	0.011196
9.	Magnesium	ICMR/BIS	4.38	30	0.027991
10.	Chloride	ICMR	28.61	250	0.003359
11.	Sulphate	ICMR/BIS	7.28	150	0.005598
12.	Phosphates	WHO	1.25	5	0.167945
13.	Nitrate	ICMR/BIS	0.57	45	0.018661
14.	Nitrite	WHO	0.034	3	0.279908
15.	BOD	ICMR	2.56	5	0.167945
16.	COD	WHO	35.09	100	0.008397

(All values except pH, Ec., and temp. are in Mg/l)



According to Parkhouse (2005), the most recent research on the economic impact of sport identifies it as a $213 billion-a-year industry, making it the sixth largest industry in the United States The wide range of organizational settings where sports occur means that individuals can select and pursue careers in the kind of work environment of their choice and for which they are best suited. Besides traditional sports, the sports industry now involves new alternative, action, and extreme sports (skateboarding, boogie boarding, ice climbing, snow kayaking, etc) and new professional sports, especially for women. An upsurge in the numbers and variety of sports publications, sports related internet sites, and enhanced mass media presentation and exposure of sports events and activities is resulting in an increase in the need for individuals with special qualifications in sport communications/media. Likewise, growth in the number and variety of specialized sports facilities, an increase in sports tourism and adventure travel, the rapid progression of the globalization of sports, and the provision of sport related goods and services for diverse market segments, is contributing to the continued growth of the sports industry. These developments ensure that the sports industry will continue to rank among the largest and most diverse industries in the nation, thereby, sustaining career opportunities for the future.

Individuals who want to pursue a sport management career should pursue an academic degree program that provides them with a thorough understanding of sport, business/management, and significant and meaningful practical work experiences related to managing sport organizations/events. A "major" in sport management is preferable to completing a "minor" or "concentration" in sport management where the degree is actually earned by fulfilling academic requirements in a related academic discipline, for example: physical education, human movement, business administration; management; communications. Since the sports industry is so large and diverse, it is possible to pursue some specialized degree programs for specific segments of the sports industry, for example: golf management; sport communications/media; sports tourism / travel / hospitality.

Educational requirement:

High school courses in the area of business, (sport) marketing, economics, (sport) sociology, (sport) psychology, (sport) history, mathematics, and (business) statistics are useful to complete in preparing to study sport management in college. Likewise, playing varsity sports, participating in school sports organizations/clubs and assisting with school sports events or clinics is highly valued since it provides individuals with strong sports backgrounds and leadership experiences.

Work Experience:

There work experiences that individuals can obtain to strengthen their backgrounds in preparing to study sport management in college include: officiating sports; coaching youth sports camps/clinics, assisting with the management and operations of sport camps/clinics; serving as a volunteer worker with professional sport teams / events; serving as a volunteer worker with college /amateur sports teams, camps, clinics, or events. Since the sports industry is so large and diverse, a wide range of career opportunities exist in a wide range of organizational settings. Some examples of career opportunities for some of the management function areas in the sports industry include:

Carrere Opportunities:

America, jobs in sport management include working for professional programs lik the NFL, NBA, MLB, NHL, MLS, and other professional or non-professional sport leagues i terms of marketing, health, and promotions. Sports management jobs[5] consist of a variety o options which include the following:

• Athletic Coach	• Operations Manager	• Athletic Director
• Business Development Coordinator	• Contract Administrator	• Contract Negotiation Manager
• Event Coordinator	• Facilities Manager	• Financial Analyst
• Fitness Manager	• Fraud Manager	• Marketing Consultant
• Marketing Coordinator	• Athlete Development Specialist	• Public Relations Manager
• Sales Coordinator	• Sport Agent	Sport Lawyer

Conclusion:

We shortly discussed sport management, carrier, job planning. etc

References:

1. DeSensi, Kelley, Blanton and Beitel, 2003).
2. www, sportmanagement.com
3. sSports Business Journal, p.23, December 1999

****

Figure 1: Comparison of Mean Values of Physicoc- hemical Parameters of Mandohol reservoir with Standards.

Table 3: Calculation of water quality index of Mandohol reservoir during September 2020 to August 2021.

Sr. No.	Parameters	Observed Value	Standard Values (Sn)	Unit weight (Wn)	Quality Rating Qn	WnQn
1.	Water temperature (^{0}C)	23.48	30	0.027991	78.26666667	2.190743
2.	Electrical Conductivity ($\mu S.cm^{-1}$)	226.05	300	0.002799	75.35	0.21091
3.	TDS	181.85	500	0.001679	36.37	0.061081
4.	pH	8.51	8.5	0.098791	100	9.879091
5.	Dissolved oxygen	7.97	5	0.167945	69	11.58817
6.	Total alkalinity	58.62	120	0.006998	48.85	0.341837
7.	Total hardness	78.48	300	0.002799	26.16	0.073224
8.	Calcium	28.03	75	0.011196	37.37333333	0.418443
9.	Magnesium	4.38	30	0.027991	14.6	0.408665
10.	Chloride	28.61	250	0.003359	11.444	0.038439
11.	Sulphate	7.28	150	0.005598	4.853333333	0.02717
12.	Phosphates	1.25	5	0.167945	25	4.198614
13.	Nitrate	0.57	45	0.018661	1.266666667	0.023637
14.	Nitrite	0.034	3	0.279908	1.133333333	0.317229
15.	BOD	2.56	5	0.167945	51.2	8.598761
16.	COD	35.09	100	0.008397	35.09	0.294659
				$\sum$Wn=1	$\sum$Qn = 615.9573333	$\sum$ WnQn = 38.67068
Water quality index WQI = $\sum$QnWn / $\sum$Wn =38.67068						

Temperature of water influences the behavior of aquatic organisms by changing the solubility of gases and salts present in the water (Rajbongshi et al, 2016). In the present study, the temperature of reservoir water observed was 23.48^{0}C, which is less than the standard value.

Electrical conductivity describes the electric current carrying capacity of the water sample. The higher value of EC indicates the high degree of waste disposal, household waste, and chemicals runoff from agriculture. Observed EC value for the water is 226.05 ($\mu S.cm^{-1}$) which is less than the standard value prescribed by ICMR (300 $\mu S.cm^{-1}$) and BIS/WHO (250 $\mu S.cm^{-1}$). It indicates low level of water pollution load. (Rajbongshi et al, 2016).

The total dissolved solids value was 181.85 mg/l which is too less than the values of standard prescribed by ICMR/BIS. It indicates low level TDS originates from natural sources, sewage, urban and agricultural runoff.

In the present study dissolved oxygen was 7.97 mg/l which changes according to the season. The DO values depend on many factors like temperature, pressure and time of sampling. Similar observations were recorded by Mondal *et al* (2017) and Pawar et al (2018).

Most aquatic organism including fishes can live in a wide range of alkalinity concentration. Mean observed value of total alkalinity was 58.62 mg/l which is low than that of the standard limit.

Hardness depends on the amount of calcium and magnesium present in the water. The values 28.3 and 4.38 mg/l shows low calcium and magnesium levels respectively in the water body that affect the total hardness value and that was 78.48 mg/l which is much lower than the standard value (300 mg/l).

Chloride is main parameter in assessing the water quality. In our study we mean observed value for chloride is 28.61 mg/l which indicate lower degree of organic pollution.

As compared to the standard the levels of Sulphate, Phosphate, Nitrate and Nitrite were observed during study were 7.28, 1.25, 0.57, 0.034 respectively showed that the water does not have eutrophication features as stated by Ogbodo et al. (2020).

Biochemical Oxygen Demand (BOD) indicates the quantity of food for bacteria found in water and provides an overall idea of the amount of biodegradable waste is present in the water. BOD value of water was 2.56 mg/l. BOD levels between 1.0 and 2.0 mg/l is considered clean; 3.0 mg/l fairly clean, 5.0 mg/l doubtful and 10.0 mg/l is bad and polluted (Rajbongshi et al, 2016).

The mean observed value for COD is 35.09 mg/l which is in the limit as per standard WHO value 100 mg/l.

The water quality index determined for the reservoir by taking yearly mean values of all stations for the study period was 38.67068, which indicates good water quality (Brown et al., 1970; Ogbodo et al., 2020). This value lies between 26-50 (grade B) it means the water of the Mandohol reservoir is suitable for the domestic, industrial and agricultural use including fish culture without any treatment but the proper treatment is required to use this water for drinking purpose.

Acknowledgements:

Authors are thankful to Principal, P.V.P. College, Pravaranagar for providing requisite facilities for the completion of this work.

Refrences:

Amadi, A. N. (2011). Assessing the Effects of Aladimma Dumpsite on Soil and Groundwater Using Water Quality Index and Factor Analysis. Australian Journal of Basic and Applied Sciences, 5(11): 763 – 770.

APHA/AWWA/WEF (2017) Standard Methods for the Examination of Water and Wastewater. 23rd Edition, American Public Health Association, American Water Works Association, Water Environment Federation, Denver.

Aware, D. V, Navgire, M. E., & Aher, H. R. (2013). Assessment of the Water Quality Index of water body at Pravarasangam, Maharashtra. *International Journal of Engineering Research & Technology (IJERT)*, *2*(11), 1363–1366.

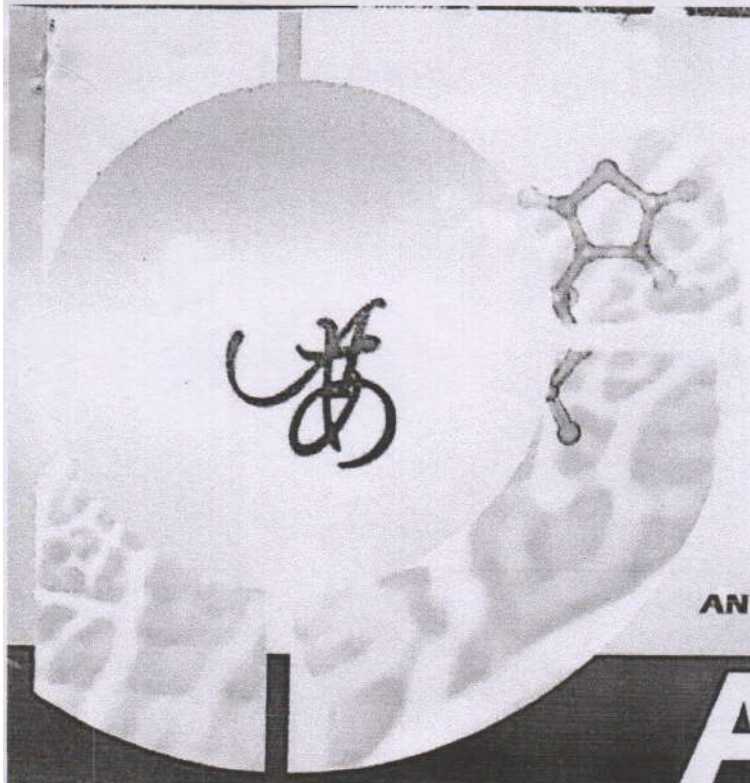
BIS. (2012). Indian Standard Drinking Water Specification (Second Revision). Bureau of Indian Standards, IS 10500 (May), 1–11. http://cgwb.gov.in/Documents/WQ-standards.pdf.

Brown, R. M., McClelland, N. I., Deininger, R. A., & Tozer, R. G. (1970). A-Water-Quality-Index-Do-we-dare-BROWN-R-M-1970.pdf. In Data and Instrumentation for Water Quality Management (pp. 339–343).Dhere Amar, M. and Pondhe Goraksh, M. (2017). Eco chronicle. *Eco-Chronicle*, *12*(3), 67–74.

Dhere A. M. and Pondhe G. M. (2017). Eco chronicle. *Eco-Chronicle*, *12*(3), 67–74.

Golterman, H L, Chlymo, R S and Ohanstand, M A M (1978) Methods for physical and chemical

18-19
UGC care

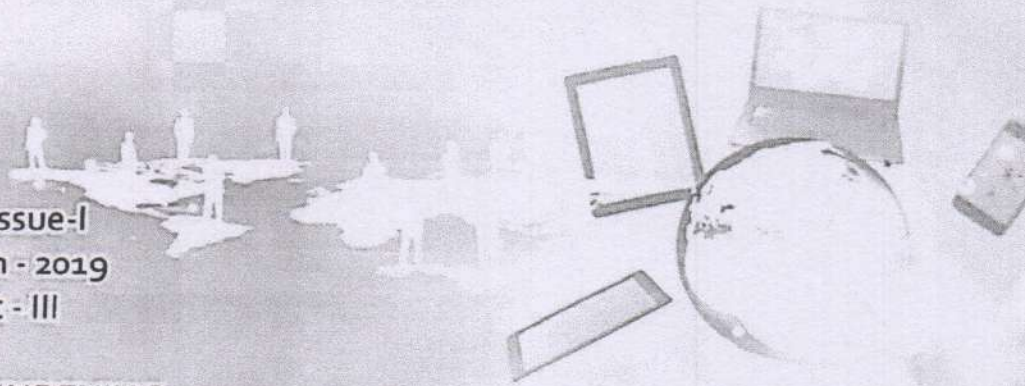


Peer Reviewed Referred
and UGC Listed Journal
(Journal No. 40776)

ISSN 2277 - 5730

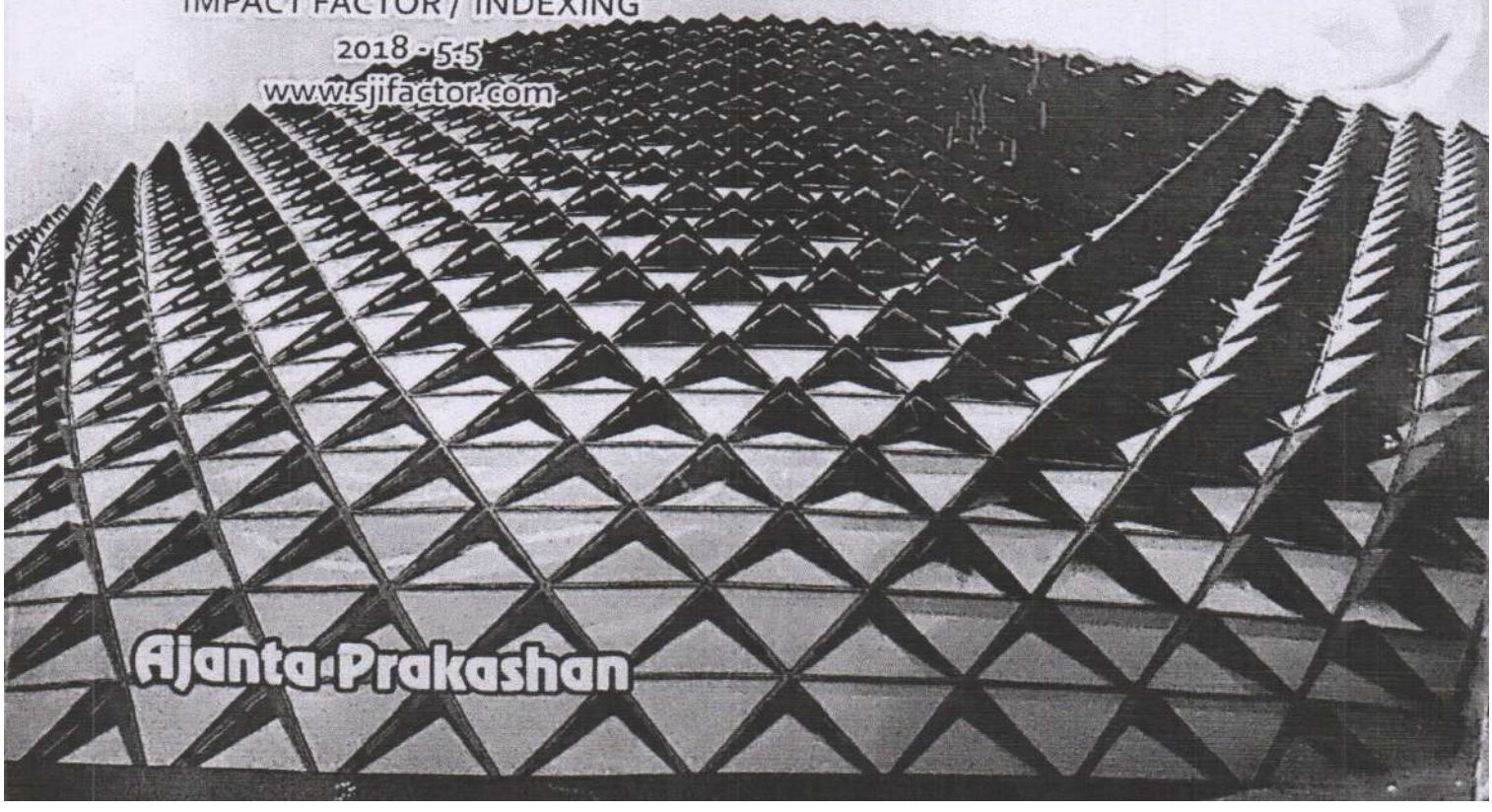
AN INTERNATIONAL MULTIDISCIPLINARY
QUARTERLY RESEARCH JOURNAL

AJANTA



Volume-VIII, Issue-I
January - March - 2019
Marathi Part - III

IMPACT FACTOR / INDEXING
2018 - 5.5
www.sjifactor.com



Ajanta Prakashan

ISSN 2277 - 5730

AN INTERNATIONAL MULTIDISCIPLINARY
QUARTERLY RESEARCH JOURNAL

AJANTA

Volume - VIII Issue - I Marathi Part - III January - March - 2019

Peer Reviewed Referred and UGC Listed Journal

Journal No. 40776

ज्ञान-विज्ञान विमुक्तये

IMPACT FACTOR / INDEXING
2018 - 5.5
www.sjifactor.com

❖ EDITOR ❖
Asst. Prof. Vinay Shankarrao Hatole
M.Sc (Maths), M.B.A. (Mktg.), M.B.A. (H.R.),
M.Drama (Acting), M.Drama (Prod. & Dir.), M.Ed.

❖ PUBLISHED BY ❖

Ajanta Prakashan
Aurangabad. (M.S.)

EDITORIAL BOARD

CONTENTS OF MARATHI PART - III

VOLUME - VIII, ISSUE - I - JANUARY - MARCH - 2019
AJANTA - ISSN 2277 - 5730 -IMPACT FACTOR - 5.5 (www.sjifactor.com)

२२. आधुनिक महाराष्ट्रातील शेतकरी लढे आणि वास्तव

श्री. प्रकाश म. गावित

सहाय्यक प्राध्यापक, इतिहास विभाग, श्री. ढोकेश्वर कॉलेज टाकळी ढोकेश्वर, ता. पारनेर, जि. अहमदनगर.

प्रस्तावना

मानवाचा सर्वांगीण विकासाची गाथा म्हणजे इतिहास होय. भारतातील मानवी समूहातील बहुसंख्य घटक शेतकरी आहे परंतु तो सर्वच दृष्टीने वंचित आहे हे वास्तव नाकारता येत नाही. शेतकरी हा प्राचीन व मध्ययुगी अर्थव्यवस्थेचा कणा होता हे सर्वाना ज्ञात आहे. परंतु आधुनिक जगात त्याचे स्थान कुठेच दिसत नाही. अशा शेतकरी समाजाच्या व्यथा व समस्या ओळखून म. ज्योतिबा फुल्यांनी २० व्या शतकाच्या उत्तरार्धात शेतीविषयक आपले क्रांतिकारक विचार शेतकऱ्याचे आसूड या ग्रंथात प्रथम मांडून महाराष्ट्रात चळवळ उभारण्याचा प्रयत्न केला त्याच विचारातून सन १८७५ मध्ये जुन्नर व पुणे परिसरात जे उठाव झाले ते फुल्यांचे क्रांतिकारक विचारांचे प्रतिबिंब होते. म. फुले हे महारष्ट्रातच नव्हे तर एकूण देशाच्या संदर्भात शेतकरी आणि शेती विषयक प्रश्न मांडणारे पहिले प्रवक्ते होते.

पुरोगामी महाराष्ट्राला शेतकरी आणि शेती विषयक जाणीव असणारे मोठे नेतृत्व लाभले आहे. यामध्ये म. फुले. क्रांतीसिंह नाना पाटील, सेनापती बापट, यशवंतराव चव्हाण, पंजाबराव देशमुख, वसंतराव नाईक, धनंजय गाडगीळ, विठ्ठलराव विखे, शरद जोशी, शरद पवार इ. मोठे नेतृत्व लाभले असून शेतकरी व शेतकऱ्याच्या मुलभूत प्रश्ना विषयी विविध लढे उभारले गेले आहेत परंतु शेतकरी समाज हा असंघटीत असल्याने आपल्याला आजचा शेतकरी हा आर्थिक व सामाजिकदृष्ट्या सर्वच क्षेत्रात मागासलेला दिसून येतो.

उदिष्टे

१. शेतकरी लढ्याचा मागोवा घेणे

२. शेतकरी आत्महत्या वास्तवाचा मागोवा घेणे

३. शेतकरी समस्या उपायाची कारणे मिमांसा करणे

संशोधन पद्धती

ऐतिहासिक विश्लेषण संशोधन पद्धती

महत्त्वाचे शब्द: वेठबिगारी, हमीभाव, भूदान, शेतकरी महिला आघाडी, किमान वेतन कायदा

महाराष्ट्रातील शेतकरी लढे

महाराष्ट्रात शेतकऱ्यांनी जमिनी, सिंचन, वेठबिगारी, मालाला हमीभाव इ. प्रश्नाबाबत विविध लढे दिले आहेत. या लढ्यातून त्यांचे मुलभूत प्रश्न काही प्रमाणात सोडवले गेले आहेत. शेतकरी लढ्यांची माहिती पुढील प्रमाणे

1. भूदान चळवळ: विनोबा भाव्यांनी १९५१च्या साली ग्रामस्वराज्याची संकल्पना मांडून भूदान चळवळ सुरु केली. विनोबांची भूदान पदयात्रा १९५१ ते १९६९ या १८ वर्षांच्या काळात चालू राहिली. ४३,८१,८७१ एकर जमीन त्यांना दान मिळाली. महाराष्ट्राच्या विधानसभेतील सरकारी आकडेवारीनुसार साधारण ५५-५६ हजार एकर जमीन महाराष्ट्रात मिळाली. त्यातील काही अजून वाटप व्हायची राहिली आहे.

2. वारली लढा: कॉ. शामराव परुळेकर आणि त्यांची पत्नी गोदावरी परुळेकर यांनी महाराष्ट्रातील ठाणे जिल्हा परिसरात वारली जमातीचे एकीकरण करून वेठबिगारी विरुद्ध लढा दिला. या लढ्याने पारंपारिक जमीनदारी वर्ग विरुद्ध वारली शेतमजूरअसा लढ्याचे स्वरूप होते. याला भारत सरकारने किमान वेतन कायदा १९४८ लागू करून प्रतिसाद दिला.१९५३ मध्ये मुंबई प्रांत आणि १९५४ साली वऱ्हाड प्रांतात किमान वेतन कायदा लागू केला

3. कामगार पक्षाचे लढे: भोर संस्थानात शेतकऱ्यांवर अन्याय केला जाई, वेगवेगळे कर लादले होते त्याच्या विरोधात १९५२ साली शेतकऱ्यांनी सत्याग्रह केला. १९२५ साली सेनापती बापट यांचं नेतृत्वाखाली मुळसी सत्याग्रह झाला. साने गुरुजीचाय नेतृत्वाखाली १९३८ साली खानदेशात कामगार पक्षाच्या शेतकरी हिताच्या चळवळी झाल्या

4. शरद जोशीचे शेतकरी लढे : १९८०च्या दशकात जोशी व त्यांच्या शेतकरी संघटनेने लोकप्रियतेचा कळस गाठला होता. त्याच काळात त्यांची गाठ धुळ्याचे मार्क्सवादी अभ्यासक कॉ. शरद पाटील यांच्याशी पडली. शरद पाटलांनी त्यांना महिलांना राजकारणात आणण्याची सूचना केली. कॉ. शरद पाटलांच्या मते, आजपर्यंतच्या राजकारणाचा पुरुषांनी सत्यानाश करून ठेवला आहे. यात महिला सुधारणा करू शकतील, ही सूचना शरद जोशींना आवडली. त्यानुसार त्यांनी १९८६ साली नाशिक जिल्ह्यातील चांदवड येथे 'शेतकरी महिला आघाडी' स्थापन केली. या प्रसंगी सुमारे पाच लाख महिला उपस्थित होत्या. एवढेच नव्हे, तर आगामी पंचायत निवडणुकीत 'आमच्या तर्फे फक्त महिलांनाच उमेदवारी दिली जाईल,' अशी ऐतिहासिक घोषणा केली. असे सांगतात की, जोशींच्या या घोषणेमुळे तत्कालीन मुख्यमंत्री शंकरराव चव्हाण एवढे घाबरले की, त्यांनी पंचायतच्या निवडणुकाच पुढे ढकलल्या. हा प्रसंग शेतकरी संघटनेच्या लोकप्रियतेचा परमोच्च बिंदू होता, असे आज म्हणावे लागते. शेतकरी संघटनेच्या आसपासच उत्तर भारतात महेंद्रसिंग टिकेत (१९३५-२०११) या शेतकऱ्यांच्या नेत्याचा उदय झाला. त्यांनी 'भारतीय किसान युनियन' ही संघटना स्थापन केली. त्यांनी १९८७ साली शेतकऱ्यांचे आंदोलन आयोजित केले व वीजबिलांना माफी यावी, अशी मागणी केली. त्यांनी १९८८ साली दिल्लीत सुमारे पाच लाख शेतकऱ्यांचा मोर्चा आयोजित केला. हा मोर्चा

अभूतपूर्व होता. यामुळे दिल्लीतील सत्ताधाऱ्यांची झोप उडाली होती. टिकैत यांच्या समर्थकांनी दिल्लीतील विजय चौक ते इंडिया गेट दरम्यान धरणे धरून दिल्लीतील वाहतुकीचे बारा वाजवले होते. हे धरणे सुमारे आठवडाभर चालले व शेवटी राजीव गांधींच्या सरकारने टिकेत यांच्या ३५ मागण्या मान्य केल्या. यातील ऊसाला वाढीव भाव, विजेच्या बिलांना माफी त्याचप्रमाणे पाण्याच्या बिलांमध्ये सूट वगैरे महत्त्वाच्या मागण्या होत्या. महेंद्रसिंग टिकैत यांच्या मृत्यूनंतर भारतीय राजकारणाच्या परंपरेनुसार त्यांच्या संघटनेचे नेतृत्व त्यांचा मुलगा नरेश टिकेत यांच्याकडे आलेले आहे. शरद जोशींच्या संघटनेला समांतर जाणारी उत्तर प्रदेशातील शेतकऱ्यांची महत्त्वाची संघटना म्हणून 'भारतीय किसान युनियन'ची दखल घ्यावी लागते.

वर उल्लेख केल्याप्रमाणे १९८०च्या दशकाच्या उत्तरार्धात जोशींची संघटना कमालीची लोकप्रिय होती. यानंतर दुर्दैवाने जोशींनी अनेक प्रकारचे राजकीय समझोते केले. जेव्हा व्ही. पी. सिंग १९८९ साली पंतप्रधान झाले, तेव्हा त्यांनी जोशींना 'ऍग्रीकल्चर प्राईस कमिशन'चे अध्यक्ष केले. या पदाला केंद्रात कॅबिनेट मंत्र्याचा दर्जा होता. जोशींनी अहोरात्र कामकरून एक अहवाल तयार केला, पण त्याची अंमलबजावणी होण्याअगोदरच व्ही. पी. सिंग यांचे सरकार अवघ्या ११ महिन्यांत कोसळले. अलीकडच्या काळात राजूशेट्टी व सदभाऊ खोत यांच्या नेतृत्वाखाली आंदोलने चालू आहेत.

5. वनहक्क कायद्यासाठी लढे: जंगलांशिवाय आदिवासी व आदिवासींशिवाय जंगले अस्तित्वातच राहू शकत नाही. आदिवासींना विकासाच्या मुख्य प्रवाहात आणायचे असेल तर त्यांना जंगलातून बाहेर काढून शहरी किंवा नागरी जीवनात वसवायचेठरविले तर हा त्यांचा वंशच्छेदच ठरेल आणि ते व्यावहारिकदृष्ट्या कुठल्याही शासन व्यवस्थेला शक्य नाही. या समूहांचा खऱ्या अर्थाने विकास प्रवाहाशी समन्वय साधायचा असेल तर त्यांच्या जल, जंगल, जमीन या नैसर्गिक संसाधनांवरील हक्कांना मान्यता दिली पाहिजे. त्यांच्यापर्यंत शिक्षण, आरोग्य, रोजगाराच्या संधीपोहोचविणे आणि नैसर्गिक साधनांचे व्यवस्थापन करून त्यांना मुलभूत अधिकार देणे हाच एक मार्ग आहे. हे ओळखून कॉ. नानासाहेब मालुसरे, कॉ. ढवळे, कॉ आ. जे.पी. गावित यांच्या नेतृत्वाखाली महाराष्ट्रात वनजमिनीवर हक्कासाठी चळवळ १९९० च्या दशकात सरू केली. मार्क्सवादी कम्युनिस्ट नेतृत्वाच्या वतीने ठाणे, नाशिक, नंदुरबार येथील आदिवासी समूहाने सतत मोर्चे, जेलभरो आंदोलन करून सरकार दरबारी प्रश्न तेवत ठेवला. त्याची परिणीती २००६च्या वन हक्क कायद्यात झाल्याचे दिसून येते.

शेतकऱ्या संदर्भात महाराष्ट्रात विविध लढे उभारले गेलेळे आहेत. राज्यकर्त्यांनी शेतकरीचे प्रश्न सोडविताना शेतीचे नियोजन केले नाही तसेच शेतकऱ्यांना भरीव आर्थिक स्वरुपाची मदत दिली नाही. कारण हा असंघटीत समूह आहे. त्या असंघटीतपणाचा सरकारने फायदा घेतला असून ग्रामीण चळवळी पेक्षा नागरी हित जवळचे त्यांना वाटते.

या कारणामुळे शेतकऱ्याचे जीवन हे प्रकाशमान होण्यापेक्षा अंधकारमय जास्त होत गेलेले आहे. आजचा शेतकरी हा जास्तीत जास्त अल्पभूदारक असून तो कर्जबाजारी आहे त्याचे कुटुंब पूर्णपणे जीवन हलाखीचे जगात आहेत. देशातील सर्वच शेतकरी समाजाचे जीवन संकटमय बनले आहे. आर्थिक प्रश्नामुळे त्यांचे सामान्य जीवन आधुनिक नागरीकरण आणि शिक्षण पासून वंचित आहे. त्यामुळेच शेतकरी वर्ग आत्महत्या सारक्या चक्रात अडकला गेला आहे.

महाराष्ट्रातील शेतकरी आत्महत्याचे वास्तव

नॅशनल क्राइम रेकॉर्ड्स ब्यूरोच्या ताज्या आकडेवारीतून शेतकरी आत्महत्यांचं भीषण वास्तव समोर आलं आहे. २०१४ च्या तुलनेत २०१५ मध्ये शेतकरी आत्महत्येच्या घटनांमध्ये तब्बल ४२ टक्क्यांनी वाढ झाली असून यातील सर्वाधिक आत्महत्या महाराष्ट्रात झाल्या आहेत. एनसीआरबी'च्या आकडेवारीनुसार २०१४ मध्ये देशात ५ हजार ६५० शेतकऱ्यांनी आत्महत्या केली तर २०१५ मध्ये ८ हजार ७ सातशे शेतकऱ्यांनी आत्महत्या केल्या आहेत.

देशातील अनेक राज्यांना २०१४ आणि २०१५ या दोन वर्षांमध्ये दुष्काळाचा सामना करावा लागला होता. त्यात महाराष्ट्राचाही समावेश होता. परिणामी महाराष्ट्रातच शेतकरी आत्महत्येच्या सर्वाधिक घटना घडल्या आहेत. महाराष्ट्रात एकूण ३ हजार ३० शेतकरी आत्महत्या झाल्या असून एकूण आत्महत्यांच्या तुलनेत हे प्रमाण ३७.८ टक्के इतके आहे. त्याखालोखाल तेलंगणमध्ये १ हजार ३५८ तर कर्नाटकमध्ये १ हजार १९७ शेतकऱ्यांनी कर्जबाजारीपणा व अन्य कारणांमुळे जीवनयात्रा संपवली. महाराष्ट्र, तेलंगणा, आंध्र प्रदेश, मध्य प्रदेश, छतीसगड आणि कर्नाटक या राज्यांमध्ये मिळून ९४.१ टक्के आत्महत्या झाल्या आहेत. विशेष म्हणजे बिहार, पश्चिम बंगाल, गोवा, हिमाचल प्रदेश, जम्मू-काश्मीर, झारखंड, मिझोराम, नागालँड राज्यात आत्महत्या झाल्या नाहीत.

शेतक-यांचे जीवनमान सुधारण्यासाठी राज्य सरकारच्या वतीने जलयुक्त शिवार, शेततळी, शेतकरी पॅकेज घोषित केले असले तरी गेल्या तीन वर्षात महाराष्ट्रात सर्वाधिक आत्महत्या झाल्या असल्याची माहिती समोर आली आहे. इतर राज्याच्या तुलनेत ही आकडेवारी चिंता निर्माण करणारी आहे. आत्महत्याग्रस्त राज्यात मध्य प्रदेशचा दुसरा क्रमांक आहे.

महाराष्ट्रात शेतीचा शाश्वत विकास करण्यासाठी राज्य सरकारच्या वतीने विविध उपाययोजना केल्या जात आहेत. विशेषत: शाश्वत सिंचन निर्माण होण्यासाठी जलयुक्त शिवार योजनेवर विशेष भर देण्यात आला आहे. राज्यावर कितीही संकटं आली तरी कृषी विभागाच्या निधीत कपात करण्यात आलेली नाही, असे सरकारच्या वतीने सांगितले जात असले तरी राज्यातील शेतक-यांच्या आत्महत्येची आकडेवारी मात्र इतर राज्यांच्या तुलनेत जास्त आहे. गेल्या तीन वर्षात राज्यात ८ हजार, ६५१ शेतक-यांनी आत्महत्या केल्याची नोंद आहे.

मूल्यमापन

आधुनिक महाराष्ट्र हा पुरोगामी महाराष्ट्र म्हणून ओळखला जातो एकूण लोकसंख्येपैकी महाराष्ट्रात आज ५८ टक्के लोक शेती व्यवसायावर अवलंबून आहेत. शेतकरी हा विविध जाती समूहात विभागाला गेला असल्या कारणामुळे त्यांचे संघटन होऊ शकत नाही. त्यामुळेच सत्ताधीस वर्ग त्यांच्या असंघटीत पानाचा फायदा घेऊन त्यांच्या मागण्या व आंदोलने सहज मोडीत काढत आला आहे. असे असले तरी आजचा शेतकरी अनेक समस्यांनी घेरला गेला आहे हे वास्तव नाकारता येत नाही. शेतकरी प्रश्नावर उपाय म्हणजे सरकारने सर्वसकट कर्जमाफी करावी असे नाही. तर शेतकरी जीवनमान सुधारणेसाठी सरकारने शेतकरी वर्गात आधुनिक तंत्रज्ञान व शिक्षण यांचा समन्वय साधून शेतकरी वर्ग स्वावलंबी कसा बनेल असे कृती कार्यक्रम आखणे गरजचे आहे.

संदर्भ

१. प्रदीप पुरंदरे- सिंचन नोंदी परिवर्तन माला -१ सचिव एस. एम.जोशी सोशालिस्ट फाउंडेशन साने गुरुजी स्मारक, सिंहगड रस्ता, पुणे प्रथमावृत्ती जुलै १९९२

२. रमेश पाध्ये- शेती शेतकरी आणि अर्थकारण, युनिक अकेंडेमी प्रथमावृत्ती मार्च २०१५

३. रमेश पाध्ये, मक्स किसान- ३० सप्टेंबर २०१७

४. डॉ. वुधाजीराव मुळीक- महाराष्ट्र टाईम्स, २३ नोव्हेंबर २०१७

५. चिंतामन पाटील- विवेक

६. प्रहार दैनिक, १७ नोव्हेंबर २०१७

७. म.टा. विनोबा आणि भूदान- प्रा. गगनेश राऊत 26 एप्रिल २०१५

८. गोदावरी परुळेकर, जेव्हा माणूस जागा होतो मौजे प्रकाशन गृह १९९४

९. प्रा. गणेश राऊत व प्रा. ज्योती राऊत, महाराष्ट्रातील परिवर्तनाचा इतिहास इ.स. १८१८ ते १९६०, डायमंड पब्लिकेशन्स सप्टेंबर २००५

2021-22

लता मंगेशकर विशेषांक

मराठी साहित्य मंडळ, कलबुरगी (गुलबर्गा)
या संस्थेचे त्रैमासिक

भाव अनुबंध

मराठी साहित्य मंडळ, गुलबर्गा
या संस्थेचे त्रैमासिक

भाव अनुबंध

वर्ष : ८ अंक : ३

चैत्र, वैशाख, ज्येष्ठ शके १९४४
एप्रिल, मे, जून २०२२

संस्थेचा पत्ता : मराठी साहित्य मंडळ, स्टेशन बाजार,
गुलबर्गा (कलबुर्गी) ५८५१०२.
दूरभाष : कार्या. (०८४७२) २३२२०७ email-s.satalkar@yahoo.com
वेळ : सकाळी ८ ते ११ व सायं. ५ ते ८. गुरुवारी साप्ताहिक सुट्टी.

या अंकाचे मूल्य : रु. ५०/-
वार्षिक वर्गणी - वैयक्तिक रु. ३००/-, संस्थेसाठी रु. ४००/-
वर्गणी कुठल्याही महिन्यापासून चेक, डीडी अथवा मनीऑर्डरच्या माध्यमाने
'Editor Anubandh' या नावाने पाठवावी.

(संपादकीय व व्यवस्थापकीय पत्रव्यवहार, अभिप्रायार्थ भेट पुस्तके, नियतकालिके, प्रसिद्धीसाठी साहित्य इ. कार्यकारी संपादकांच्या नावे संस्थेच्या पत्त्यावर पाठवावे. प्रसिद्धीसाठी साहित्य ईमेल वरही पाठविता येईल. या अंकातील लेखांत व्यक्त झालेल्या मतांशी संपादक सहमत असतीलच असे नाही.)

अंतरंग.....

महाराष्ट्रातील वनहक्क कायद्याची अंमलबजावणी : आदिवासी जीवन समस्या व वास्तव

• श्री. प्रकाश महादू गावित

गोषवारा (Abstract)

भारतातील आदिवासी समाजाचे संवर्धन आणि त्यांना मूळ प्रवाहात आणण्यासाठी 'राज्यघटनेत भाग X कलम २४४-२४४A मध्ये तरतुदी केल्या आहेत.'[१] परंतु आजही बहुतांश आदिवासी समाज विकासापासून वंचित आहे. पेसा (Panchayat Extention to Scheduled Areas act 1996) कायदा आदिवासी समाजाच्या उपजिवेकेसाठी आहे. भारत सरकारचा २ जानेवारी २००७चा 'वनहक्क कायदा' भारतीय आदिवासी जीवनातील मैलाचा दगड ठरला आहे. वनहक्क कायद्याच्या वैशिष्ट्यावरून या कायद्यात आदिवासी समाजावर होणारा अन्याय दूर करण्याचा प्रयत्न भारत सरकार करत आहे हे दिसून येते. या कायद्याची स्थानिक पातळीवर अंमलबजावणी करण्यासाठी खूप अडचणी येत आहेत. ह्या अडचणी दूर करण्यासाठी वन विभागाने आदिवासी समूहा बरोबर सामंजस्य वृद्धिंगत करून दूरगामी उपयोगी उपक्रम आखणे गरजेचे आहे. या उपक्रमातून आदिवासी जीवनमान उंचावेल व पर्यावरणाचाही समतोल साधला जाईल या दृष्टीने संशोधन लेखात आशय मांडण्याचा प्रयत्न केला आहे.

मूळ शब्द (Key word)

वनहक्क, वनपट्टी, ग्रामवन, भोगवटा क्षेत्र, एकसाली-दळीबुके, दळीधारक, ग्रामवन व्यवस्थापन समिती.

उद्दिष्टे (Ocjectives)

१. महाराष्ट्रातील वनहक्क कायद्यची अंमलबजावणी विषयी माहिती मिळवणे.

२. आदिवासी जीवनातील वनहक्क कायद्यामुळे झालेल्या बदलाचा शोध घेणे.

संशोधन पद्धती (Research Methodology)

प्रस्तुत संशोधन लेखासाठी वर्णनात्मक, विश्लेषणात्मक व तुलनात्मक या संशोधन पद्धतीचा अवलंब केला आहे.

प्रस्तावना (Introduction)

आदिवासींचे वन संपत्तीवरील हक्क कायद्याने मिळून देण्यासाठी कम्युनिस्ट पक्ष, किसान सभा व आदिवासी जमातीच्या संघटनेच्या माध्यमातून स्वातंत्र्योत्तर काळापासून दीर्घकाळ संघर्ष चळवळी चालू आहेत. आदिवासींच्या वनहक्क या न्याय्य मागणीसाठी काँग्रेस आघाडीचे सरकार२००४ साली सत्तेत आल्यावर किमान कॉमन प्रोग्राम अंतर्गत वन संपत्तीवर आधारित असलेल्या लोकांसाठी वन मालकी हक्क देण्यात येईल असे आश्वासन दिले. त्यानुसार सरकारने विस्थापित प्रकल्पग्रस्त व भूमिहीन आदिवासींचे पुनर्वसन व त्यांच्या अधिकाराचे संरक्षण करण्यासाठी २००६ मध्ये वनाधिकार संरक्षण कायदा संसदेसमोर मांडला. वनहक्क कायद्यामुळे भारतातील 'एकसाली जमिनी/दळी आहेत, ज्या ब्रिटिश सरकारने आदिवासींना कसायला दिल्या होत्या.'[१] असे आदिवासी लोक व शासनाच्या निकषात बसणारे भूमिहीन आदिवासी लोकांना न्याय मिळाला.

भारतातील आदिवासी समाजाचे संरक्षण करण्यासाठी वनहक्क संरक्षण कायदा अंमलात आला आहे. 'वनहक्क कायदा १३ डिसेंबर २००५ मध्ये संसदेत प्रथम मांडला.'[१] या कायद्याचे फायदे तोटे यावर सार्वजनिक चर्चा होऊन भारताच्या संसदेने डिसेंबर २००६ मध्ये वन हक संरक्षण कायदा संसदेत पास केला. त्यामुळे भारतातील १०.४३ कोटी (२०११ च्या जनगणनेनुसार) आदिवासी लोकांना न्याय मिळणार आहे. भारतात एकूण लोकसंख्येपैकी आदिवासींची लोकसंख्या ८.६% इतकी आहे.

राष्ट्रपतींनी २९ डिसेंबर २००६ रोजी वनहक्क कायद्यास मंजुरी दिली आणि २ जानेवारी २००७ पासून हा कायदा अस्तिवात आला. वनाधिकार संरक्षण कायद्याच्या प्रास्ताविकेमध्ये नमूद केले आहे की, 'वने आणि वन्यजीव संरक्षण अधिनियम कायद्याने पारंपरिक आदिवासी समाजावर झालेला ऐतिहासिक अन्याय दूर करण्यासाठी हा कायदा बनवण्यात येत आहे. यावरून हे स्पष्ट होते की, आदिवासींवर ऐतिहासिक अन्याय'[११] दूर करण्यासाठी भारत सरकारने केलेल्या भूतकाळातील उपाययोजना व कायदे अपयशी ठरले आहेत हे अधोरेखीत झाले आहे.

वनहक्क कायदा प्रत्यक्ष अमलात आणण्यापूर्वी या कायद्याची वैशिष्ट्ये आदिवासी समाजाला समजून देणे अथवा वनहक्क कायद्याची समाजात जनजागृती करणे गरजेचे आहे. वनजमिनीचे जिल्हा, तालुका व ग्रामीण पातळीवर जिल्हा अधिकारी व वन खाते यांनी खालील वैशिष्ट्यांचा आधार घेऊन नियोजन करून वंचित घटकांना ज्ञान देणे अपेक्षित आहे.

वनहक्क कायद्याची वैशिष्ट्ये

१. वनहक्क कायद्याने जंगलात राहणारा आदिवासी आणि अन्य पारंपरिक वनजातींना वन्य जमिनीचा ताबा व वनहक्क मिळणार.

२. आदिवासी जमातींनी जंगलातील जैविक विविधतेचे संरक्षण करावे अशी कायद्याने तरतूद केली आहे.

३. आदिवासी आणि अन्य पारंपरिक वनजाती कुटुंबांना ४ हेक्टर वनजमीन मिळेल.

४. या कायद्याने गावाच्या अंतर्गत आणि बाह्य सीमेत मिळणाऱ्या पारंपरिक वन्य संपत्तीचे मालकी हक्क आदिवासींना देण्यात आले आहेत. (उदा. जंगलातून मिळणारे सुके लाकूड, मध, लाख, कंदमुळे, औषधी वनस्पती, तेंदू पत्ता, जंगली फळे आणि बिया इ.)

५. ज्या आदिवासी समाजाने १३ डिसेंबर २००५ पूर्वी वनजमिनीवर पुनर्वसन केले आहे किंवा त्यांना तेथून विस्थापित केले आहे अशा आदिवासींना या कायद्याने पुनर्वसनाची मान्यता दिली आहे.

६. आदिवासींना वनहक्क वंश परंपरेने आहेत; परंतु हे वनहक्क पती व पत्नी या दोघांच्या नावावर असले पाहिजेत. जर स्त्री-पुरुष कोणी एक वारसदार असेल किंवा कोणी प्रत्यक्ष वारसदार नसेल, तर ते हक्क इतर कुटुंबातील सदस्यांकडे असतील.

७. कोणत्याही आदिवासींची मान्यता आणि त्याची ओळख झाल्याची प्रक्रिया पूर्ण झाल्याशिवाय त्या वनजमिनीवरून बेदखल केले जाणार नाही. ज्या लोकांना सरकारी हस्तक्षेपामुळे मोबदला मिळाला नाही याचे पुरावे दिले आहेत अशा वंचित लोकांना या कायद्याने भूमिहीन आदिवासी व गैर आदिवासी दोघांनाही वन अधिकार दिला आहे.

८. सरकारला वनजमिनीवर शाळा, अंगणवाडी, पाणीपुरवठा, रस्ते, वीज आणि दूरध्वनीसाठी बांधण्याचा अधिकार आहे; परंतु विस्थापित व्यक्तीला

योग्य मोबदला देण्यात यावा.

९. ग्रामसभेस व्यक्तिगत व सामुदायिक वनहक्क संबंधी प्रस्ताव करण्याचा अधिकार देण्यात आला आहे. ज्या आदिवासी लोकांना वनजमिनीची आवश्यकता आहे अशांसाठी ग्रामसभा समाधान करू शकली नाही, तर जिल्हास्तरावर अपील करून त्या प्रस्तावाचा निकाल ६० दिवसांत लावण्याची व्यवस्था केली आहे.

१०. ग्रामसभा वनहक्क बाबत प्रथम वनहक्क समिती स्थापन करेल. त्यात कमीतकमी १० व जास्तीत जास्त १५ सदस्य असतील. त्यात १/३ सभेने मंजूर केलेले प्रस्तावाची छाननी करेल आणि त्याचे रेकॉर्ड तयार करून जिल्हास्तरीय समितीकडे पाठवेल.

वनहक्क : आदिवासी जीवन समस्या व वास्तव

वरील वैशिष्ट्यांनुसार या कायद्याने आदिवासींच्या जीवनात आमूलाग्र बदल होणार असे वरपांगी दिसून येते; परंतु २००७ साली अमलात आलेला कायदा अजूनही दीड दशकानंतरही पूर्णपणे अंमलबजावणी करून आदिवासी समाजाला न्याय देऊ शकला नाही. महाराष्ट्राचे राज्यपाल भगतसिंग कोश्यारी यांनी १८ मे २०२० रोजी एक अधिसूचना कडून 'जे दावे पेसा क्षेत्रातील फेटाळले आहेत त्याविरुद्ध दाद मागता येईल असा अध्यादेश काढला.'[४] त्यामुळे वंचित आदिवासींना न्याय मिळणार आहे. पुढील तक्त्यानुसार वैयक्तिक व सामुहिक वन जमिनीचे दावे महाराष्ट्र शासनाकडे दाखल झाले होते.

पुढील तक्त्याच्या अभ्यासानुसार आदिवासी लोकांनी जे वनजमिनीचे दावे दाखल केले होते त्यातील ३१.९१% दाव्यांना मंजुरी मिळाली व २/३ दावे फेटाळण्यात आले हे सिद्ध होते.

वास्तविक 'भारतीय वन' या शासकीय क्षेत्रात फक्त वनाच्छादित क्षेत्रच नव्हे, तर फिरती शेती, शेत, चराई, देवराई, ढोर-फोडी, स्मशानभूमी, वनोपजासाठी नियोजित क्षेत्र, गवताळ क्षेत्र इत्यादी सर्वच जमीन येते. ते कसे ? वन क्षेत्राची कागदोपत्री निर्मिती ब्रिटिश सरकारने आपल्या सोयीनुसार अथवा बळजबरीने केली होती. अशा क्षेत्रांना सरसकट वन घोषित केले. त्या काळात ज्या भागातील स्थानिकांनी एकत्र येऊन ब्रिटिश सरकारविरुद्ध संघर्ष, विरोध किंवा करार केला तेथे काही तुटपुंजे हक्क त्यांना दिले गेले. या हक्कांना स्थानिक पातळीवर निस्तारी हक्क किंवा अशा नावाने नोंदवलेले आहे. काही ठिकाणी स्थानिकांना डावलून वनाच्छादित जमीन एका कुटुंबाच्या, संस्थानिकाच्या किंवा जमीनदाराच्या नावानेही

येथील वनजमिनीकडे आपणास बघावे लागेल. आदिवासींचे जीवन हे वनशेतीवर अवलंबून आहे हे कायद्याने मान्य केले आहे. ब्रिटिश काळापासून मागोवा घेतला, तर शासन औद्योगिक, शहरीकरण व पर्यटन विकासासाठी आदिवासी लोकांच्या जमिनी हस्तांतरित करतात. त्यामुळे आदिवासी लोकांचे मोठे विस्थापन झालेले आहे. वर्तमान काळातील वास्तव आपणास नाकारता येत नाही. ज्या आदिवासी लोकांना शासनाच्या अध्यादेशामुळे वनजमिनी मिळाल्या आहेत त्यातून त्यांचे जीवनमान किती सुधारले आहे याचा शोध घेऊन तुलनात्मक अभ्यास करणे काळाची गरज आहे. आदिवासींचा 'मागासलेपणाचा ठपका सरकार बाजूला सारत आहेत; पण व्यवस्था यात खोडा घालते. 'ग्रामवन'सारख्या नियमांमध्ये विकासाची स्वप्ने अडविली जातात'[५] असे वरपांगी दिसून येते. महाराष्ट्रातील गोंदिया, गडचिरोली, नंदुरबार, पालघर व कोकणातील आदिवासी जीवनातील वनहक्क कायद्याने स्थलांतर, बेरोजगारी, आर्थिक प्रश्न सुटले का ? भारतीय संविधानात बाजू लक्षात घेऊन वनहक्क कायदा, पेसा कायदा व ७३ व्या घटना दुरुस्तीमुळे आदिवासी लोकांना भारतीय नागरीकरणात आणण्यात आपण कितपत यशस्वी झालो आहे याचे उत्तर काही अंशी नकारात्मक येते हे दिसून येते.

निष्कर्ष (Conclusion)

महाराष्ट्रातील बहुतांशी आदिवासी अज्ञानी व अल्पभूधारक आहेत. १९२७ च्या ब्रिटिश कायद्यान्वये काही आदिवासी वनजमिनींचे दळीभूधारक आहेत हे सत्य आहे; परंतु वर्तमानात त्यांचे पुरावे शासनाकडे सादर करणे आदिवासी लोकांना आव्हानात्मक आहे. लालफितीमुळे पुराव्याअभावी वारस नाकारणे हे दुर्दैव आहे. पूर्वीपासून कसत आलेले वनप्लॉट नवीन कायद्यामुळे पुराव्याअभावी नाकरले, तर आदिवासी जमाती परत अंधकारात लोटल्या जातील अथवा नक्षलवादी चळवळीकडे आकर्षित होतील, हे सरकारने लक्षात घेणे गरजेचे आहे. भारतातील बहुतांशी आदिवासी समाज हा निरक्षर, दारिद्र्य, श्रद्धा व अंधश्रद्धा या चौकटीत बंदिस्त झालेला दिसून येतो. एकीकडे आदिवासी वर्षानुवर्षे फक्त पारंपरिक शेती व शेतमजूर या आर्थिक गोष्टींवरच अवलंबून आहे. आदिवासी लोकांना सामाजिक न्याय देण्यासाठी सरकारला वन संवर्धन करून वनहक्क कायद्याची अंमलबजावणी करणे गरजेचे आहे. सरकारने वन खात्यातर्फे स्थानिक वनसंपत्तीचे वर्गीकरण करून तेथील वनावर चालणारे लघु उद्योग निर्माण कारवेत व आदिवासींना रोजगाराच्या संधी उपलब्ध करून देणे काळाची गरज आहे. स्वतंत्र भारतात संविधानाने

आदिवासींना मुख्य प्रवाहात आणण्यासाठी भरीव तरतूद केली असताना या ७५ वर्षांच्या कालखंडात आदिवासी लोकांना त्यांच्या हक्कासाठी झगडावे लागते हे निश्चितच लोकशाहीसाठी भूषणावह नाही !

संदर्भ

१. वनहक्क व पेसा कायदा माहिती पुस्तिका, उप विभागीय अधिकारी तथा उप विभागीय समिती, राळेगाव. Email : sdo.ralegon@gmail.com

२. महाराष्ट्र शासन, आदिवासी विभाग, शासन निर्णय क्र. वहका-२०१८/३३का-१४.

३. 'वनहक्क कायदा हा केवळ देखावा ?', म. टा., २० जानेवारी २०११.

४. महाराष्ट्र राज्य राजभवन, वन हक कायदा राज्यपाल अधिसूचना, २७ मे २०२०.

५. 'वनहक्कांवर 'नियमा'ची कुऱ्हाड', विनोद वाघमारे, म. टा., २४ सप्टेंबर २०१४.

६. 'वननिवासींच्या हक्कांवर टांगती तलवार', अनुजा दाते, रोशनी कट्टे, सकाळ, २६ नोव्हेंबर २०१९.

७. 'दळीधारक झाले जमिनीचे मालक', लोकसत्ता, शीतल उगले, जिल्हाधिकारी, रायगड, १६ फेब्रुवारी २०१६.

८. 'वन ग्राम नियम आदिवासींच्या मुळावर', लोकसत्ता, १३ मे २०१४.

९. 'भारतीय संविधान व भारतीय राजकारण' भाग १, २, महेश सिरपूरकर व तुकाराम जाधव, निक अकादेमी, पुणे.

१०. महाराष्ट्र शासन आदिवासी आयुक्तालय http://www.mahatribal gov.in/1164/FRA

११. 'कहाणी एका यशस्वी सामुहिक वन हक दाव्याची', लता प्रतिभा मधुकर, NCAS.

- श्री. प्रकाश महादू गावित

साहाय्यक प्राध्यापक, इतिहास विभाग

श्री ढोकेश्वर कॉलेज, टाकळी ढोकेश्वर,

ता. पारनेर, जि. अहमदनगर

मोबा. : ८२७५५८३२७९

★ ★ ★

लोकाभिमुख
पर्यावरणतज्ज्ञ

– रामचंद्र गुहा

संस्थापक
साने गुरुजी

साप्ताहिक
साधना

Date of issue
शनिवार,
२८ मे २०२२
मूल्य रु. ४०
(एकूण पृष्ठे : ४४)

मुकुंद टाकसाळे

द्रष्टा विचारवंत र.धों. कर्वे

'समाजस्वास्थ्य' म्हणजे फक्त लैंगिक मार्गदर्शन किंवा लैंगिक मजकूर असं मात्र नव्हे. र.धों.नी त्यांच्या अंकांतून समाजाच्या आरोग्याचे विविध प्रश्न हाताळले. चित्रपट-नाटकांची परीक्षणे, संगीतातील चीजा आणि त्यांतली (मुळात नसलेली) अश्लीलता, मिश्र विवाह व समाजाची त्यांप्रति असणारी असहिष्णुता, पित्ताशयाचे विकार, हातपाय कशाने फुटतात, शाकाहार-मांसाहार, पाणी कसे प्यावे, चीनमधील मजुरांची पिळवणूक, कॉलरा कसा टाळावा, मलेरियाचा प्रतिबंध, स्त्रियांची स्वच्छता, दातांची स्वच्छता असे अनेक विषय.

र. धों. कर्वे
चित्र : रोहन आळंद

नवे पुस्तक

प्रकाश महादू गावित

जेथोड : आदिवासी विद्यार्थ्याचे आत्मकथन

आदिवासी समाजजीवन व संस्कृती याविषयी बरेच लेखन झाले आहे. आदिवासींच्या समस्या कमी-अधिक प्रमाणात सारख्या असल्या तरी लेखकाने या पुस्तकात साध्या भाषेत आदिवासी मुलाची कैफियत मांडली आहे. 'जेथोड' हे २५६ पानांचे पुस्तक असून त्याची रचना बारा प्रकरणांत केली आहे. त्याला प्रस्तावना 'लोक बिरादरी' प्रकल्पाचे हेमलकसा संचालक डॉ. प्रकाश आमटे यांनी लिहिली आहे.

'जेथोड' म्हणजे काय, हा वाचकांना प्रश्न पडू शकतो. जेथोड या शब्दाचा अर्थ लेखकाने अक्षय तृतीया ते पावसाळ्यापूर्वीच्या काळास आदिवासी लोक 'जेथोड' म्हणतात, असा सांगितला आहे. जवळपास एक महिन्याचा हा काळ आदिवासींच्या जीवनात आणीबाणीचा असतो. या काळात पावसाळ्यातील चार महिने जगण्यासाठी अन्नधान्य, गुरांची वैरण, सरपण, घराचे छप्पर, शेतीची मशागतीपूर्व कामे करून तो मेटाकुटीस आलेला असतो. तटपुंजे उत्पन्न असलेला कोकणा आदिवासी प्राप्त परिस्थितून मार्ग काढतो. एकीकडे एक वेळचे पोट भरताना त्याला संघर्ष करावा लागतो. कोकणा आदिवासी अडाणी असल्याने आपली दैना सरकारपुढे मांडत नाही, की त्या प्रश्नाला वाचा फोडत नाही! आपलं नशीब फुटके मानून रामजी, तुकारामसारखे अनेक मूक आदिवासी नायक जीवन जगत आले आहेत. जेथोडच्या काळात जमविलेल्या पुंजीतून तो पावसाळाच्या चार महिन्यांत तग धरून उभा राहतो. होळीच्या यात्रेत आदिवासी यात्रेनिमित्त भेटतात व म्हणतात की, 'जगलो वाचलो तर पुढच्या वर्षी भेटू.' यावरून आदिवासींच्या दारिद्र्याची कल्पना येते. जेथोडचा समर्पक अर्थ यातच दडला आहे. लेखकाला जन्मापासून संघर्षमय जीवन जगायला मिळाले म्हणून 'जेथोड' हे शीर्षक समर्पक आहे.

या पुस्तकाच्या मुखपृष्ठावर आदिवासी गावाचे मातकट रंगांचे चित्र आहे. यातून आदिवासी समाज अजून विकासापासून कितीतरी दूर आहे हा संदेश दिला आहे. या चित्रात मुंगी एक दाणा घेऊन वारुळावर दाखवली आहे. चित्रकाराने कोकणा आदिवासींचे जीवन हुबेहूब रेखाटले आहे. ज्याप्रमाणे न थकता, न बोलता कितीही संकटे आली

भारतीय शिक्षणाच्या प्रवाहात सर्वांत शेवटी आलेला समाज म्हणजे आदिवासी समाज होय. भारताच्या सुवर्णमहोत्सवी कालखंडानंतरचा विचार केला, तर आदिवासी जमाती ह्या सामाजिक, राजकीय व शैक्षणिकदृष्ट्या अजूनही मागास आहेत. आदिवासी जमातींची शैक्षणिक जागृती न झाल्याने आपले हक्क, कर्तव्य व अभिव्यक्ती स्वातंत्र्यापासून ते वंचित आहेत. त्याचे दर्शन 'जेथोड' या पुस्तकात पाहावयास मिळते. 'कोकणा' ही आदिवासी जमात नाशिक, पालघर, धुळे व गुजरात राज्यात डांग, वलसाड जिल्ह्यांत आढळून येते. नाशिक जिल्ह्यातील 'खुंटीचा पाडा'वरील आदिवासी मुलगा ते प्रथम वर्ग अधिकारी होण्याचा प्रवास म्हणजे 'जेथोड' हे आत्मकथन. लेखक हिरामण झिरवाळ. या पुस्तकात आदिवासी, निसर्ग-संस्कृती व मुलांचे शिक्षण, दारिद्र्य व संघर्षमय शिक्षणामुळे झालेले परिवर्तनाचे वास्तववादी यात केले आहे.

अनुक्रम

संस्थापक संपादक : साने गुरुजी
Date of issue
२८ मे २०२२
वर्ष ७४ / अंक - ४१

संपादक :
विनोद शिरसाठ
सहयोगी संपादक मंडळ :
अभय टिळक, अतुल देऊळगावकर
मनोहर जाधव, रझिया पटेल

मुखपृष्ठ मांडणी : गिरीश सहस्रबुद्धे

व्यवस्थापक आणि अक्षररचना : सुरेश माने

मुद्रितशोधन : विनायक भंडारी

'साधना' हे साप्ताहिकमालक, साधना ट्रस्ट यांचेसाठी प्रकाशक हेमंत नाईकनवरे यांनी मुद्रक, चंद्रशेखर जोशी, श्री.जे.प्रिंटर्स प्रा.लि. १४१६ सदाशिव पेठ, पुणे ४११०३० येथे छापून, **साधना साप्ताहिक, ४३१ शनिवार पेठ, पुणे ४११०३०.** येथे प्रसिद्ध केले.
Ph.: 020-24451724 / Mob.: 7028257757
weeklysadhana@gmail.com
http://weeklysadhana.in
साधना मीडिया सेंटर (पुस्तकविक्री केंद्र)
Ph.No. : 020-24459635

वार्षिक वर्गणी :
एकवर्षासाठी : ९०० रुपये
दोन वर्षांसाठी : १८०० रुपये
तीन वर्षांसाठी : २७०० रुपये

वर्गणीची रक्कम रोख किंवा/म. ऑ./डी. डी./चेक 'साधना साप्ताहिक' या नावाने काढून, साधना कार्यालयाकडे पाठवावी. किंवा वरील QR कोड स्कॅन करून, अथवा साधना साप्ताहिक, बचत खाते क्र.**60025586634, IFSC MAHB 0000001, बँक ऑफ महाराष्ट्र**, बाजीराव रोड शाखा, पुणे ३० येथे वर्गणीची रक्कम जमा करावी. आणि मग नाव, पत्ता, फोन नं. इत्यादी तपशील साधना कार्यालयाला इ-मेल अथवा फोन करून कळवावेत.

(अंकातील सर्व छायाचित्रे इंटरनेटवरून साभार. अंकात व्यक्त झालेल्या सर्वच मतांशी संपादक सहमत असतीलच असे नाही.)

Follow us :
weeklysadhana.in
facebook.com/weeklysadhana/
twitter.com/WeeklySadhana
YouTube/WeeklySadhana

तरी मुंगी अविरत काम करते तसा आदिवासी कोकणा माणूस निमूटपणे जीवन जगत आला आहे. जेथोडमधील नायक सरकारविरुद्ध टीका करताना दिसत नाही की दुःखं करत नाही. मलपृष्ठावर बालपणीतील सफरचंद खाण्याची इच्छा नोकरी लागल्यावर पूर्ण केली याचा सुंदर दाखला दिला आहे.

लेखकासारखे असे कितीतरी आदिवासी मूक नायक या जीवनचक्रात सुखाचा एक क्षणही न उपभोगता काळाच्या पडद्याआड गेले असतील, याचा आपणांस पुस्तक वाचताना प्रत्यय येतो. 'मुक्काम पोस्ट खुंटीपाडा' या प्रकरणातून आदिवासी लोकांची दैना पाहावयास मिळते. भारताच्या स्वातंत्र्यानंतरही आदिवासी लोक आरोग्य, शिक्षण, रोजगार व भौतिक सुविधांपासून वंचित आहेत, याचे वास्तव लेखकाने जिवंतपणे मांडले आहे. नाचणीची भाकर व चटणी खाणारा हिरामण चौरस आहाराचे चित्र पुस्तकात बघतो. भनवडच्या आठवडी बाजारातील आईच्या हातातील गोडेतेलाची बाटली भरलेली दिसली की लेखकाचा ऊर भरून येतो. आजही आदिवासी बालके कुपोषणाच्या फेऱ्यात का अडकली आहेत याचे उत्तर जेथोडमध्ये मिळते. लेखकाने पारंपरिक शिक्षण घेतलेल्या आदिवासी पदवीधर झालेल्या बेरोजगार युवकांचा प्रश्न उपस्थित केला आहे.

'दिवलीचे फूल' या प्रकरणात गावात प्रथम वीज येते याचा सुंदर अनुभव लेखकाने रेखाटला आहे. गावात आलेली ही वीज कोणत्या राजकीय पुढाऱ्याने आणली आहे की, सरकारने आदिवासींच्या कल्याणासाठी योजना सुरू केली आहे, याची आदिवासी गावकऱ्यांना माहिती नाही. याचे कारण अज्ञान असे आपण म्हणू शकू. परंतु ज्या वीज कामगारांनी गावात विजेचे काम केले- त्यांचे आभार व कौतुक करायला तो विसरत नाही. पुस्तकातील प्रकरणे वाचताना कोकणा लोकांचा भाबडेपणा व जिज्ञासा व मानवता प्रत्येक ठिकाणी दिसून येते. लेखकाचे वडील तुकाराम सालदार आहेत. आर्थिक बाजू कुमकुवत असताना पत्नी, सहा मुले व आंधळी व मूकबधिर अशा दोन मेव्हण्या घेऊन ते संसार चालवतात. गरिबीतही आधार देता येतो हा आदर्श लेखकाचे आईवडील निर्माण करतात.

आदिवासी मुलांचे आदर्श म्हणजे निसर्ग व शेतकरी. परंतु काळाबरोबर त्यांच्यात शिक्षणाची आवड असणे गरजेचे आहे. आदिवासींना शिक्षणाच्या प्रवाहात आणणे हे शिक्षकाचे मोठे कसबाचे काम आहे. लेखक हिरामण झिरवाळ यांच्या शैक्षणिक प्रवासात आपणांस कष्ट, जिद्द, चिकाटी, न्यूनगंड दिसून येतात. ग्रामीण विद्यार्थी जेव्हा उच्च शिक्षणासाठी शहराकडे येतात तेव्हा त्यांना योग्य मार्गदर्शनाची गरज असते. नाहीतर हुशार विद्यार्थ्यांत न्यूनगंड निर्माण होतो व आदिवासी मुले मागे राहतात. डॉक्टर होण्याची स्वप्ने घेऊन आलेला लेखक परिस्थितीमुळे शिक्षक होतो. आई व विधवा बहिणीला घेऊन झोपडपट्टीत राहतो. अभ्यास करून पदवीधर व पहिल्याच प्रयत्नात प्रथम वर्ग अधिकारी तहसीलदार होतो.

लेखक शेवटी 'धूळपेरा' या प्रकरणात 'स्पर्धा परीक्षा हे मृगजळ आहे,' असे भाष्य करतो. जे पेराल ते उगवेल असे नाही तर आपल्यातील सुप्त गुण ओळखून वाटचाल करावी, जीवन म्हणजे पैसा, प्रसिद्धी यापुरते मर्यादित नसून जीवनातील आनंदाचा शोध घ्या, असे लेखक सांगतो. मी अधिकारी झालो नसतो तर एक चांगला शिक्षक, कवी, लेखक झालो असतो व स्वतःची ओळख निर्माण केली असती.

पुस्तक वाचताना वंचित आदिवासी जमातीचे कायमचे दारिद्र्य, जीवनातील दोन वेळच्या जेवणाचा सततचा चाललेला संघर्ष दिसून येतो. लेखकाने आदिवासी मुलांना सरकारी सवलती, आरक्षण, वसतिगृहांची खरंच गरज आहे का, याविषयी कोणतेंही भाष्य किंवा मागणी केली नाही. परंतु आदिवासींचे जे वास्तव मांडले आहे त्यातून सरकार व प्रस्थापित लोकांना मागास आदिवासी लोकांना प्रवाहात आणण्यासाठी प्रभावी कृतियुक्त पावले उचलण्यासाठीचा संदेश देण्याचा प्रयत्न केला आहे. त्यामुळे जेथोड हे त्यांचे आत्मकथन न ठरता संपूर्ण आदिवासी समाजजीवनाचे जिवंत विदारक वास्तवदर्शी कथन आहे. पुस्तक वाचून झाल्यावर मलपृष्ठावरील लेखकाच्या अनुभवासारखं 'अख्खं सफरचंद' खाण्यासारख्या आनंदाऐवजी आदिवासींविषयी संवेदना निश्चितच निर्माण होईल!

प्रकाश महादू गावित
pkshgavit8@gmail.com

जेथोड
हिरामण तुकाराम झिरवाळ
प्रकाशक : वैशाली प्रकाशन, पुणे
किंमत : ३०० रुपये

How to Cite:
Thombe, S., & Virgin, B. A. (2022). A view of the select divine imagery in psalms. *International Journal of Health Sciences*, *6*(S1), 10679–10689. https://doi.org/10.53730/ijhs.v6nS1.7556

A view of the select divine imagery in psalms

Sonaji Thombe
Ph.D. Research Scholar, Department of English, Karunya Institute of Technology and Sciences, Coimbatore, India
Corresponding author email: sonajithombej@gmail.com

Dr. B. Anita Virgin
Assistant Professor, Department of English, Karunya Institute of Technology and Sciences, Coimbatore, India

***Abstract*---**The concept of God by the Hebrew mind is not projected in pompous psychological, philosophical, and theological complex terms. It was not a great deal of the learned mind but empirical knowledge of shepherds, warriors, battles, temple services, etc. characterized the world of imagery full of freshness and significance. The imagery in the book of Psalms is based upon conceptual relationships and divine principles which are integrated appropriately from the traditional and conceptual metaphorical analysis. Among the varied divine images, the image of God as a Refuge is a predominant one that makes room for many other protective images. It signifies the existing relationship between Yahweh and Israel, Christ and the Church. The imagery asserts a spiritual need of man to be in the right relationship and intimate prayer fellowship with God to defend oneself from the destructive powers of the enemy. Metaphorical images underline the allegorical interpretation as well as typological relations. The paper deals with some of the select divine images and their significance contextually.

***Keywords*---**Divine imagery, Psalms, Refuge, rock, salvation, well, chariots.

Introduction

The psalmist sings like an instrument of God, representing a society inspired by prophetic prayers. Filled with ecstatic visions, prophecies, and stories of powers, a visionary prophet reveals God for whom he speaks. He makes known God's will in connection with a specific occasion of comfort, love, salvation, restoration, judgment, war, sin, trouble, natural disaster, etc., in a state of enthusiasm or divine possession. At a point in time, God in him reveals his nature and history as well as his will, and so a larger pattern of character and ritual is built up out of a series of oracular pronouncements, as is very clear from the emergence of the

Messiah myth from the oracles of the Hebrew prophets. Such as these and other psalms include divine imagery that needs to be evaluated to understand how the psalter contributed to God's divine imagery and revelation about his attributes and acts.

Yahweh as Refuge and Savior

In the Old Testament, the terms *machceh* (Ps 14:6; 46:1; 62:7-8; Isa 4:6, etc.), and *manoc* (2 Sam 22:3; Ps 59:16, etc.) are mainly applied to God to refer to Him as a refuge of His people. Conceptually, it gives the idea of a safe place and a resort for the destitute. The term has various renderings such as 'refuge', and 'dwelling-place' in Deut. 33:27 according to the *King James Version* and *Revised Version* (British and American) respectively, and 'high tower' in Ps 9:9. Alternatively, the term 'refuge' stands for 'shelter' in Ps 61:3 and 'hope' in Jer. 17:17 between the above referred versions (Chamberlain "Refuge"). The psalmist trustworthily says, "I will say of the LORD, "He is my refuge and my fortress, my God, in whom I trust." (Ps. 91:2). Yahweh as refuge is a metaphor used by the Psalmist and other places to refer to God as the only sure hiding place when either pursued by the enemies and haven to the shipwrecked condition of life and in situations where a person has nowhere to go and no one to help.

A person chased by his enemy seeks a place where he would be protected and helped by someone. Such a place of safety cannot be found on the earth nor can any who can guarantee one. The real place to seek protection is God Himself. God's hand can comfort the troubled in every calamitous and devastating circumstance. Life desperately needs comfort and peace when a person is abashed and tossed by stormy winds. Because the help cannot come from any man nor it could be found anywhere, man has to surrender to the Almighty who can rescue him from the critical crisis. The real sense of refuge is best explained in the context of orphans, widows, homeless, destitute, exiled, banished, segregated, and ostracized classes of people. Further, the significance is seen when oppressed, suppressed, depressed, bondage, and persecuted by the enemy cry unto God for help. In lonely circumstances, a person has nowhere to go and none to help except to look up to God for rescue and deliverance. Jerome Creach's 1996 work shifts the focus of psalms studies from its shaping and placement to the psalms' vocabulary that shapes the theme and theology by employing the metaphor of refuge (Cousins 4). The refuge metaphor itself does not act independently but incorporates other clusters of images.

The terms for refuge used are rock (Ps 18:2; 31:2; 62:7; 94:2), wings (Ps 36:7; 57:1; 61:4; 91:4), a fortress (Ps 59:16; 71:3; 91:2) and a strong tower (Ps 61:3). Psalm 144:2 portrays inclusively "my rock and my fortress, my stronghold and my deliverer, my shield and he in whom I take refuge" (*RSV*).

Arms

Arms of God are lovingly comforting images. One of the more comforting images in the Bible is that communicated by the symbolic use of the plural *arms:* God carrying his people. The divine warrior, whose arm so threatens his enemy, joins his arms together to carry his people: "The eternal God is your refuge, and

underneath are the everlasting arms" (Deut. 33:27). Isaiah 40:11 pictures God as a shepherd, leading his flock and carrying the lambs in his arms (*Dictionary of Biblical Imagery* 190). God also provides refuge for his people, and what is found in God is so precious that it cannot be found anywhere else (Ps 61:4; 69:20) (*DBI* 999) and of those who flee to him as a refuge to enjoy the security of a divine haven (David, 2 Sam 22:3; Jer 16:19; Ps 59:17; 142:5) (*DBI* 1011)**.**

Wing

The wings image indicates tender, loving care and protection. In Ps 17:8 there is marvelous imagery in the plea, "Hide me under the shadow of thy wings." In Ps 18:10 there is a reference to "the wings of the wind." And in 55:6 the Psalmist cries, "Oh that I had wings like a dove!" In Ps 36:7 the lovingkindness of God is glorified and the trust for protection under the 'shadow of the wings' is expressed. The splendor and peace of prosperous times are beautifully described in Ps 68:13, the wings of a dove covered with silver, and her pinions with pale green-gold.' The first rays of dawn are compared to "the wings of the morning" (139:9). Solomon was thinking of the swiftness of wings when he said, "For riches certainly make themselves wings; They fly away like an eagle toward heaven" (Prov 23:5). In semblance, Isaiah in Isa 40:31 wrote, "They that wait for Yahweh shall renew their strength; they shall mount up with wings as eagles; they shall run, and not be weary; they shall walk, and not faint." In Mal. 4:2 the *King James Version*, there is a beautiful reference, "But unto you that fear my name shall the Sun of righteousness arise with healing in his wings." the *Revised Version* (British and American) changes "his" to "its." Wings as an emblem of love were used by Jesus in the cry, "O Jerusalem …. how often would I have gathered thy children…. as a hen gathereth her chickens under her wings" (Matt 23:37) (Porter "wings").

Rock

In English and Hebrew language, a clear distinction between stone and rock is not demarcated. Hence, the imagery of stone and rock cannot be associated in the same way. A rock outcrop in the regions of Sinai and the Negev contains a crevasse to hide and shelter (Ex 33:22; 1Sam 24:2), a shadow from the sun (Is 32:2), a fortified position (Ps 27:5), and a capacious fountain of water from spring rains (*DBI* 1880). The origin of God as Israel's rock comes with the attributes such as unchanging, eternal refuge, and defender (2Sam 2:2; 22:2–3, 32, 47) and many verses in the Psalms (e.g., Ps 19:14; 18:46; 62:1–2, 7). The main excerpt in this imagery is Genesis 49:24, nevertheless, there are many other significant references in the Song of Moses (Deut. 32:1–43). The significance of rock as a place of protection is distinguished by recurrent expressions, such as "rock of refuge," specifically in the Psalms (Ps 31:2; 62:7; 71:3). The conceptual metaphor of God as a rock is so apt that God is called the rock to indicate the steadfastness of God (2 Sam 23:3; Hab. 1:12). Knowles Michael suggests that rock image manifests itself as a symbol of divine strength (316).

The Metaphoric analysis of Rock

Rock images recur in Psalms 28, 31, 61, 62, 71, 78, 92, 94, and 95. In Exodus rock metaphorically becomes the fountain. It is a Mountainous terrain in Psalm

36:6; Ps 89:12 describes its superiority in greatness. God as rock has a multi-faceted and connotative aspect of meanings. The metaphorical mapping of rock imagery takes its origin from the OT and extends to the NT. The rock metaphor has differing semantic realizations. Differing situations and circumstances create a new aspect of meaning seeing God in various situations reflects His character and personality which draw out His attributes. The realizations often seem to be pragmatic in approach. It's worthwhile to view and analyze them specifically in the context of the study.

God as Creator

In the Scripture verse of Deuteronomy 32:18 Moses said, "Of the Rock who begot you, you are unmindful. And have forgotten the God who fathered you". The verse is uttered when Moses through the inspiration of the Holy Spirit began to sing the song. In one place the verse revealed that the people of Israel had forgotten the God who created them and that they should remember Him. The verse connotes the ironic situation where people have gone astray after strange gods. Perversely, they had forsaken and forgotten their God who delivered them. Moses here reminds people of the real God, calling Him the Rock, who fathered them.

God as the Defense and Refuge

David in Psalm 94: 22, affirms by saying, "But the LORD has been my defense, And my God the rock of my refuge." It is an empirical statement from the battlefield by David affirming and declaring that the great victories in the battles won were given to him by His God. In adverse times, David took refuge in God the rock when he wandered as a refugee. Here, the shift of image glimpses us into the defensive aspect of the battleground. At times, while battling against the enemy the warriors had to strategize and launch the attack. It had to be done with great diligence and skill. However, it was not the warrior who fought with his strength, power, and skill, it was God who defended the warrior, helped him in devising new winning strategies, and techniques, and supplied power, even his battle was brought to victory by God. It was vested within the power and will of God to give the victory in the battle. David was a mighty king and warrior who often ascribed the victory in a battle to his God. He had realized that it was not his strength responsible for bringing victory but he had to depend on God for victory. Therefore, based on his experiences and battle prowess David asserted the above verses which were his real-life formidable events.

In Psalm 31:2 he cries for help, "Bow down Your ear to me, Deliver me speedily; Be my rock of refuge, A fortress of defense to save me." Here he makes an urgent plea for swift deliverance. Psalmist seeks refuge in God from his enemies seeing God as his rock of refuge. He envisions God as a fortress wherein he would be protected safely from the enemy. And the fortress for David becomes a fortress of defense against his enemies that housed him and saved him. It is an indestructible place where David is protected safely and is saved.

God as Fortress

In most cases images are used combinedly than singly or separately as in 2 Sam 17:2; Ps 18: 2,3; 71:3; 91:3; 144:2. However, a distinguishing sense can be sharply noted in each differing image used by the psalmist, which demands a specific analysis. In Psalm 18:2 he asserted, "The LORD is my rock, and my fortress, and my deliverer; my God, my strength, in whom I will trust; my buckler, and the horn of my salvation, and my high tower."

The verse mentions seven metaphors for God, namely rock, fortress, deliverer, strength, buckler, horn, and tower. The sense expressed about safety shows that God has been to David as a rock, a tower, a buckler, etc. He received protection from God through the designated places of security called a rock, a tower, a citadel, and a buckler. These elevated and lofty places provided him an escape from enemies who pursued him. The recurrence of these images can also be stressed and compared in Judg. 6:2; Ps 27:5; 61:2.

The deliverer rescues him from his enemies. 'My God' implies the idea of who God has been to him, a Father, Helper, Friend, Protector, Saviour. My buckler, the word is used elsewhere in Ps 3:3 and is translated as 'shield'. The horn of an animal is a means of defense. It represents the strength for protection that would be used to attack the enemies. Here the idea is personified as what the horn to an animal meant, in the like manner, God was to the psalmist. This recurring image can be compared in other places Ps 22:21; 75:4-5, 10; 92:10; 132:17; 148:14.

'My high tower' as a person finds safety in the tower from danger so David envisions his God as a high tower where he can be safe. The word occurs in Ps 9:9 where it means 'refuge'. Prov 18:10 reveals it, 'The name of the Lord is a strong tower; the righteous run to it and are safe'. The towers were intended to be inaccessible to enemies and were built on rocks, craggy mountains, or on the high walls of the city to keep them safe. The images also echo in Jer. 16:19, "O LORD, my strength, and my fortress, and my refuge in the day of affliction, the Gentiles shall come unto thee from the ends of the earth, and shall say, Surely, our fathers have inherited lies, vanity, and things wherein there is no profit".

The verse is a cry unto the Lord, my strength... in the day of affliction, which harmonizes with Ps 28:8; 59:17; 18:3, the deliverance of Israel comes from Yahweh God, but the idols of gentiles are not able to save them in the face of tribulation. In this apparent contradiction of power and defeat, they are filled with shame, vanity, worthlessness, and the lie of their idols and come to acknowledge the true saving power of Yahweh. It is an awakening to gentile nations whose idolatry when proven powerless in the coming tribulation should not persist in it.

Ps 71:3, "Be my rock of refuge, to which I can always go; give the command to save me, for you are my rock and my fortress." David has found sure help in God. He has guaranteed hope and expected that he would always be helped at any time whenever he turned to Him with child-like faith and confidence. And if God gives the command to save David he would be saved by the God-given command. The command would be the binding absolute security where no enemy would dare to touch him

God as Mountain, Hill

Hills and mountains are very often personified. They become joyful together as viewed in Ps 98:8 by the goodness of God as they are crowned with the beauty and for having clothed them with verdant grandeur. Therefore, they seem to be rejoicing in God. In Psalms 114:4, the Leaping of mountains and hills for joy is compared to that of rams and lambs. It has also alluded to Ex 19:18 (Ps 68:8; Judg. 5:4). Isa 44:23 is a song of redemption. It calls out heavens, earth, mountains, forests, and every tree in it to celebrate and be jubilant for Jacob has been redeemed. And the God of Israel is glorified in them. Isaiah 55:12 calls for rejoicing and singing by mountains and hills in peace for the abundant life they received from God. Is 49:13 denotes anything that comes in the way of redemption is the sin, mountains here visualize the image of big sin which stands to hinder the way of salvation. In the quest for reaching the Gospel of salvation to the world and nations, the oppositional forces of wickedness show up in the form of these mountains. To which God says that mountains would be removed and a road would be prepared and thus, God's highway of righteousness and holiness would be elevated. At God's touch or presence, they tremble and shake (Judg. 5:5; Ps. 68:8; Isa. 64:1; Nah 1:5; Hab. 3:10) or melt (Ps 97:5; Mic 1:4). They are addressed by God (Ezek. 6:3) and called to witness a covenant lawsuit (Mic 6:1). Symbolically the mountains represent power (Jer. 51:25; Zech. 4:7), continuance or stability (Deut. 33:15; Ps. 30:7; 125:1; Isa 54:10; Hab. 3:6), and protection (Ps 125:2). They are also symbolic of God's strength (Ps. 65:6) and blessing (Deut. 33:15) (Lee "Mountain, Hill").

God as Salvation

"Oh come, let us sing to the LORD! Let us shout joyfully to the Rock of our salvation" (Ps.95:1). David in this Psalm seems to be in high spirit, is filled with the joy of the Holy Spirit, he is inspired to worship God. In his joyful mood, he calls others as well to worship God and sing praises to the Lord. He tells other devotees to shout joyfully to the Rock who is their salvation. David as a worshiper calls the congregation to participate in the worship of God the Rock who is their salvation. The metaphor of the rock here is spoken in the conception of God as the salvation of His people. Here the psalmist calls people to worship the God of their salvation joyfully and collectively.

God as Saviour

Isaiah had prophesied the promise of Saviour in chapter 19:20, "And it will be for a sign for a witness to the Lord of hosts in the land of Egypt; for they will cry to the Lord because of the oppressors, and He will send them a Savior and a Mighty One, and He will deliver them."

The Israelites living in the land of Egypt were subject to the Pharaoh, figuratively, Egypt could be taken as the whole world, and Israelites could refer to the nation as a whole and the Church as well. The gentile kings and kingdoms being in opposition to their ways systematically oppressed and led them into cruel slavery and bondage. Here in this desperate situation needed the savior who could destroy their oppressor hence, they would have to cry unto the Lord to send the

Messiah the Mighty One who could save and deliver them. The deliverance was not something sought after in immediate context but it was futuristically envisioned in the permanent Messiah, the Savior of the whole world, the Christ himself who did, in reality, fulfill the promise of salvation and paved the way into the kingdom of God and His millennial kingdom.

Isa 43:3, “For I am the Lord your God, The Holy One of Israel, your Savior; I gave Egypt for your ransom, Ethiopia and Seba in your place”. Israel as a chosen nation is precious in His sight. God designed them to be peculiar and special people. God entered into a relationship with Israel with covenant promises. To fulfill the purposes written in promises and to prove His faithfulness, He is even ready to ransom the nations like Egypt, Ethiopia, and Seba, but save the chosen nation. God would sacrifice everything He had to save His beloved. Nothing could stand before the covenant relationship between God and His chosen nation. It is an unbreakable bond of love that guarantees the absolute safety of His beloved. His highest and grandest mission of salvation was exemplified in Christ. This is the true mark of the true savior.

Jer. 14:8, assures of the Saviour, “the Hope of Israel, his Savior in time of trouble, Why should You be like a stranger in the land, And like a traveler who turns aside to tarry for a night?” This verse entails that God has provided the sure hope of saving in the time of trouble, therefore, no one should live without it like a stranger or traveler who has no identity and knows not the way where they go respectively. Again Hos 13:4, guaranteed thus, “Yet I am the Lord your God Ever since the land of Egypt, And you shall know no God but Me; For there is no savior besides Me”. God assures by this verse that since the beginning of time He alone is God the savior and there is none besides Him. Luke 1:47, “And my spirit has rejoiced in God my Savior”. Mary the mother of the Lord Jesus rightly testified of God as her savior. Luke 2:11, “For there is born to you this day in the city of David a Savior, who is Christ the Lord”. In fulfillment of all the given prophesies of the coming Messiah this is the climactic event, the climax itself in the whole history of mankind witnessing that the savior, Christ the Lord was born in the city of David. John 4:42, “Then they said to the woman, "Now we believe, not because of what you said, for we ourselves have heard Him and we know that this is indeed the Christ, the Savior of the world." The Messiah that was to come in the world was Jesus Christ, this fact was confirmed and confessed by the Samaritan woman and the people. Acts 13:23-24, “From this man's seed, according to the promise, God raised for Israel a Savior- Jesus-” Further the stakes of Israel’s savior are confirmed and revealed by apostle Paul.

Titus 1:4, “To Titus, a true son in our common faith: Grace, mercy, and peace from God the Father and the Lord Jesus Christ our Savior”. Titus 2:13-14, “looking for the blessed hope and glorious appearing of our great God and Savior Jesus Christ,” Jesus Christ is the savior of His church who will come back to translate what His church is hoped for. Jude 25, declared “To God our Savior, Who alone is wise, Be glory and majesty, dominion and power, Both now and forever. Amen”. The verse confirms to God the savior belongs all glory and majesty, dominion and power from now to forever.

10686

God of Salvation Illustrated by:

Horn

Consider Ps 18:2, “The Lord is my rock and my fortress and my deliverer; My God, my strength, in whom I will trust; My shield and the horn of my salvation, my stronghold”. The image of the horn has been used for salvation by God and represents that, animals have horns with which they play defense. The horn contained the strength which is used to protect and defend in danger. The idea implied that God was to the psalmist what the horn is to animals, the means of his defense. The image is recurrent elsewhere and is comparable in Ps 22:21; 75:4-5, 10; 92:10; 132:17; 148:14. Luke 1:69, “And has raised up a horn of salvation for us in the house of His servant David.” Here, the horn of salvation is referred to Jesus Christ who was born in the house of David (Luke 2.11). Because “Salvation is of the Jews” (John 4.22). And “Salvation is of the Lord” (Jonah 2:9).

Tower

2 Sam 22.51, says, “He is the tower of salvation to His king, And shows mercy to His anointed, To David and his descendants forevermore”. The ‘tower of salvation’ is a term figuratively used for Yahweh. In Yahweh is the salvation and safety who always shows mercy to His anointed, to David, and his children, and those who comprise his kingdom. David considered the name of the Lord a strong tower (Ps 18.10). In Psalm 144.2 he calls God a ‘high tower’ possibly because the enemy will be unable to reach there (Ps 61.3).

Helmet

Isa 59.17 described, “For He put on righteousness as a breastplate And a helmet of salvation on His head; He put on the garments of vengeance for clothing, And was clad with zeal as a cloak”. A helmet is a cap used for the protection of the head in the battle against the attack of the enemy (1 Sam 17.5, 38; Ezek. 27.10). Psalms 60.7; 108.8 referred to Ephraim as the helmet for God. In the New Testament, the Greek equivalent is used (Eph 6.17, 1 Thess. 5.8). Eph 6.17-18, “And take the helmet of salvation, and the sword of the Spirit, which is the word of God;” In the New Testament, the helmet is a weapon of spiritual warfare used for defense against the kingdom of Satan and spiritual wicked forces of darkness.

Shield

2 Sam 22:36, “You have also given me the shield of Your salvation; Your gentleness has made me great” is also described in Psalm 18.35. Further, Psalm 18.2 also mentions the shield of salvation. The shield of Your salvation has been made available to the believer in Christ; now therefore any unsaved fear is easily overcome with the saving faith in Christ.

Lamp

Isa 62:1, “For Zion's sake I will not hold My peace, And for Jerusalem's sake I will not rest, Until her righteousness goes forth as brightness, And her salvation as a

lamp that burns". The salvation here is compared to a lamp that burns. Or it may be taken for light. Salvation is the light, he who gets the gift of salvation finds the light of life (John 8.12; Ps 18.28; 119.10).

Cup

Ps 116:13, "I will take up the cup of salvation, And call upon the name of the LORD." The psalmist assures of lifting high up the cup of salvation in thanksgiving and drinking for a manifold and abundant salvation experience.

Clothing

Bible makes specific references to the clothing of salvation. In 2 Chron 6:41 a request is made, "…Let Your priests, O Lord God, be clothed with salvation, And let Your saints rejoice in goodness". In Ps 132:16 assurance is given, "I will also clothe her priests with salvation, And her saints shall shout aloud for joy". The Hebrew verbs metaphorically depict endowment with power or quality such as righteousness (Job 29:14; Ps 132:9), glory and splendor (Job 40:10), and salvation (2 Chron 6:41; Ps 132:16; Isa 61:10). Psalm 149:4 confirms that God takes pleasure in His people and "He will beautify the humble with salvation". It is spoken of the humble that they would be beautified with salvation. The humble could become beautiful with salvation.

More precisely Isa 61:10 prophesied, "I will greatly rejoice in the Lord, My soul shall be joyful in my God; For He has clothed me with the garments of salvation, He has covered me with the robe of righteousness, As a bridegroom decks himself with ornaments, And as a bride adorns herself with her jewels". There are two types of garments, one is inner and the other outer. In the verse, both garments are provided. Inner garment to cover the sin's nakedness and outer the robe of righteousness which is the righteousness of God through Christ where no one could blame.

Wells

Well, the image has an extraordinary significance, Isaiah wrote in chapter 12:3, "Therefore with joy you will draw water From the wells of salvation." It is evident here that salvation refers to a drink of the living water offered by Christ as the gift of God (John 4:10). The term well is used in several passages that indicate the spring that produced "living water" (Gen 24:13,16), (i.e., flowing water; Song 4:15).

Walls and bulwarks

Isaiah chapter 26:1 gives an obvious image, "We have a strong city; God will appoint salvation for walls and bulwarks". It is referring to the heavenly Jerusalem city with a great and high wall (Rev 21:12) Bulwarks were erected at certain distances along the walls, usually at the corners, and upon them were placed the military engines from which the defensive fire was shot at enemies in all directions (Ps 48:13). Isa 60:18 makes a prophetic claim, "Violence shall no longer be heard in your land, Neither wasting nor destruction within your

borders; But you shall call your walls Salvation, And your gates Praise". Salvation is received by every man like a wall. It is a wall of fire to the adversary on one side, and on the other side, the one who is within the wall, it is shelter.

Chariots

Here Hab. 3:8 mentions the chariots of salvation saying, "O Lord, were You displeased with the rivers, Was Your anger against the rivers, Was Your wrath against the sea, That You rode on Your horses, Your chariots of salvation?" The poetic imagery describes the Israelites' journey through the desert and wilderness to the Promised Land and their inheritance. When the Israelites crossed through the parted Red Sea on a dry road, the enemies in pursuit of them headed their way through but soon their chariots sank into the mud, and riders were drowned. The enemy who trusted and boasted of the chariots and horses could not protect them (Ps 20.7). But God's chariots were chariots of salvation that saved Israelites through the Red Sea. David added that the "chariots of God" are His angels (Ps 68.17, 46.7,11; 2 Kings 2.11; 6.17; Dan 7.10; Matt 26.53).

A victory

1 Cor 15:57, "But thanks be to God, who gives us the victory through our Lord Jesus Christ". Salvation is a victory over sin, death, and the kingdom of darkness of the devil which is brought by Lord Jesus Christ. God ascending on high can mean victory (Ps 47.5).

Conclusion

The paper has analyzed a view of the select divine imagery. Its wider and broader implications have been considered. Divine imagery contextualized different aspects of human life where God's concern about protection, safety, defense, pastoral care, kingdom, and eternity have been revealed. The analysis accounted for the formation of the proper sense of the concept of divine imagery. The structure of imagery could be organized on the scale of the divine, and the human world. From these worlds, the established relationship between the divine, and human is investigated and outcomes explained. In totality, the imagery of God and Christ represented by varieties of thought patterns that evolved across the period of time have been explained.

References

The Holy Bible. Dake's Annotated Reference Bible: Authorized or King James Version Text. Finis J. Dake. Dake Publishing, Inc., Georgia, 2011. Print.

The Holy Bible. New King James Version, Thomas Nelson Publishers, Nashville, 1999. Print.

Frye, Northrop. *Anatomy of Criticism.* Princeton: Princeton University Press, 1957. Print.

Abrams, M. H. *A Glossary of Literary Terms.* 9th ed. Boston: Wadsworth Cengage Learning, 2009.

"Arm." *Dictionary of Biblical Imagery,* edited by Leland, Ryken, James C. Wilhoit and Tremper Longman III. Gen. Editors. USA: Inter Varsity Press, 1998. www.pdfdrive.net. Accessed 9 March 2019.

Brown, William P. *Seeing the Psalms: A Theology of Metaphor.* Louisville: Westminster, 2002. John Knox Press. https://books.google.co.in/.

Brueggemann, Walter. *The Message of the Psalms: A Theological Commentary.* Minneapolis: Augsburg, 1984, www.bookZZ.org. Accessed 17 Feb 2021.

Chamberlain, G. "Refuge". *International Standard Bible Encyclopaedia*, edited by Dr. James Orr, Vol. I, Chicago: The Howard-Severance Company, 1915. Biblesoft, Inc.Cousins, Melinda. "The Metaphor 'Yahweh As Refuge' in the Psalms." *Crucible Theology & Ministry*, 1:1, May 2008. http://www.crucibleonline.net/.

Hill A. E. "Rock". *The International Standard Bible Encyclopedia,* edited by Bromiley Geoffrey, Rev. ed.**,** Grand Rapids, Michigan: William B. Eerdmans Publishing Company, 1979. Biblesoft, Inc.

Hoffmeier, J.K. "Symbolic Use of Weapons: bow." *International Standard Bible Encyclopaedia,* edited by Bromiley Geoffrey, Rev. ed.**,** Grand Rapids, Michigan: William B. Eerdmans Publishing Company, 1979. Biblesoft, Inc.

King, Henry M. *The Messiah in the Psalms*. Philadelphia: American Baptist Publication Society, 1899. World Public Library Edition, 2010. www.WorldLibrary.net. Accessed 17 Feb 2021.

Knowles, Michael P. "The Rock, His Work Is Perfect: Unusual Imagery for God in Deuteronomy XXXII". *Vestus Testamentum*, Vol. 39, Fasc. 3, July 1989, pp. 316. https://www.jstor.org/stable/1519607. Accessed 24 October 2018.

Lee, G. A. "Mountain". *The International Standard Bible Encyclopedia,* edited by Bromiley Geoffrey, Rev. ed.**,** Grand Rapids, Michigan: William B. Eerdmans Publishing Company, 1979. Biblesoft, Inc.

Porter, Gene S. "Wings". *International Standard Bible Encyclopaedia*, edited by Dr. James Orr, Vol. I, Chicago: The Howard-Severance Company, 1915. Biblesoft, Inc.