



Jijamata Mahavidyalaya, Buldhana

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Research Papers Published

© 2021 JETIR December 2021, Volume 8, Issue 12

2021

www.jetir.org (ISSN-2349-5162)

JETIR.ORG

ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue



**JOURNAL OF EMERGING TECHNOLOGIES AND
INNOVATIVE RESEARCH (JETIR)**

An International Scholarly Open Access, Peer-reviewed, Refereed Journal

ZOOPLANKTON DIVERSITY IN A FRESHWATER LAKE OF PENTALKI, Maharashtra

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ABSTRACT

Zooplankton is an important component of an aquatic ecosystem's trophic structure and plays an important role in energy transmission. The present study work has been conducted at Pentakli lake , district Buldana. Because of their fast responsiveness to environmental changes, zooplankton biodiversity serves as an ecological indicator of the aquatic environment. The impact of seasonal fluctuations on zooplankton biodiversity was investigated in the Pentakali Lake in this study. water sample were collected for the period of one year in monthly sampling from June 2019-May 2020.A total of 40 species belongs to three groups such as Rotifer(22 species),cladocera (14 species) and copepod (4 species)

From the study,the physico-chemical parameters of the Pentakli Lake was positively correlated with the zooplankton. Rotifera was the dominant group throughout the study period among the groups of zooplankton.

Keywords : species, zooplankton, impact ,biodiversity Pentakli, Buldana

INTRODUCTION :

Zooplankton is a worldwide organism that can be found in all freshwater tropical wetlands. The current study focuses on the monthly fluctuations in Zooplankton variety and density in the Pentakali Lake, Buldana ,Maharashtra. From June 2019 to May 2020 the work was completed over a one-year period. Pentakli Lake there were four different populations of Zooplankton. Zooplankton are heterotrophic organisms that eat phytoplankton, replenish nutrients through metabolism, and transport energy to higher trophic levels (Steinberg and Robert, 2009). It is critical for the recycling of nutrients and the cycling of energy in their respective environments. These are the most important natural food sources for fish, as they are directly tied to their survival and growth, and they form the foundation of all aquatic ecosystems' food chains and food webs (Miah etal., 2013)

These are the most important natural food sources for fish, as they are directly tied to their survival and growth, and they form the foundation of all aquatic ecosystems' food chains and food webs (Miah et.al., 2013). They are the most important food source for omnivorous and planktivorous fishes, as well as for fish larvae culture (Alam et.al., 1987).



Because zooplankton differs from site to site within the same area with similar ecological parameters, both qualitative and quantitative studies of zooplankton in a waterbody are critical for running a successful aquaculture business (Boyd, 1982) Zooplankton is a vital link in the energy transmission from producers to aquatic carnivores (Thayer et.al., 1974) Because it is heavily influenced by environmental factors and responds fast to changes in physical and chemical conditions as well as environmental conditions, zooplankton is an excellent indicator of changes in water quality.

Because it is significantly affected by environmental factors and responds fast to changes in physical and chemical conditions as well as environmental conditions, zooplankton is a useful indicator of changes in water quality. Nutrient loading, acidity, sediment input, and other disturbances all have an impact on zooplankton ecosystems. It's an excellent tool for comprehending. Despite the fact that numerous works on Zooplankton diversity have been reported from various parts of India, there are few reports from freshwater bodies in Northeast India, with the exception of Sharma and Sharma (2008), Kar and Barbhuiya (2004), Kar (2007), Kar and Kar (2013), So, the present study was an attempt for reporting Zooplankton diversity of Pentakli Lake of Buldana district.

MATERIALS AND METHODS

Pentakli Lake is a man-made lake on the Penganga River near Mehkar in the Buldana district of Maharashtra, India. Pentakli Lake is located in the Buldana district. It is located between the latitudes of 20.2706815°N and 76.4749182°E.

Zooplankton sampling:

From June 2019 to May 2020, zooplankton sampled collected over a year. Zooplankton was sampled regularly from the site using Battish's normal procedures (1992). The sample was then filtered and placed in a Tarson (100 ml) container, which was then fixed in Lugol's solution and stored in a cool, dark location.

Samples were taken in a Sedgwick-Rafter counting chamber and inspected under a light microscope at required magnification (X 10 initially, followed by X 40) to explore the variety of Zooplankton. Specimens were recognised using standard literature from Battish (1992), Edmondson (1959), and others. The sample was then filtered and placed in a Tarson (100 ml) container, which was then fixed in Lugol's solution and stored in a cool, dark location. Samples were taken in a Sedgwick-Rafter counting chamber and observed under a light microscope the required magnification (X 10 initially, then X 40) to study the diversity of Zooplankton. Specimens were identified using standard literature of Battish (1992); Edmondson (1959), Michael and Sharma (1998); Sharma (1998); Sharma and Sharma (2008).

RESULTS AND DISCUSSION

During the current investigation, 40 species of Zooplankton from the wetland were discovered, divided into three groups: Rotifera, Copepoda, and Cladocera. Among the species that were identified Many researchers across the country have made similar observations. Kar & Kar (2013) identified 26 Zooplankton species in an oxbow lake in Cachar, Assam; Tyor et al. (2014) investigated Zooplankton diversity in a shallow lake in Gurgaon, India. Pawar (2014) identified 66 species of Zooplankton in certain freshwater bodies near Satara district of Maharashtra, India, with Rotifera having the most diversity, Cladocera having the second highest diversity, and Copepoda having the lowest diversity. The Zooplankton population density status recorded from Sat Beel is presented in table . Our remarks are affirmed by higher richness known than the reports from lakes and reservoirs of Guthiataal, wetland of Bahraich (U.P), India INDIA (Ashok K.V. and Sadguru P. 2020), During the research period, Cladocera Throughout the year, Diaphanosoma sp., Sida sp., Chydorus sp., Ceriodaphnia sp., Bosmina sp., Alona sp., and Moina sp. were discovered; among Copepoda, Mesocyclops sp., Neodiaptomus sp. were discovered; and among Rotifera, Brachionus Anuraeopsis sp., Asplanchna sp., Ascomorpha sp., Testudinella sp., Trichocerca sp., and Scardium sp. are some of the species that have been identified. The current study demonstrates that species richness has a high value, indicating that the wetland is suitable for the dominating species (Arora and Mehra 2003). The research site in this study was



The Rotifera group was shown to be dominating among all other Zooplankton groups in the current investigation. The dominance of the rotifera group is a common feature in tropical freshwater wetlands, according to Mwebaza-2005 Nadwula's research. The current study discovered that the population density of Rotifera group reported from the study site varies according on the season. Its density was maximum in December, according to reports

Rotifera was followed by Cladocera, then Copepoda, as reported by Tyor et al. (2014) in their study of Zooplankton diversity in a shallow lake in Gurgaon, Haryana, where Rotifera was followed by Cladocera, then Copepoda, with only four taxa accounting for 20% of the total Zooplankton population. Zooplankton diversity reflects the water quality and they are the good indicator of changes taking place in the water resources, Kobra et.al., (2016) carried out a research work to analyse zooplankton of fresh water ecosystem in the Washim town, Maharashtra, India

As a result, taking in mind the significance of :-

Following the findings of the study, actions should be done to conserve and maintain the freshwater wetland.

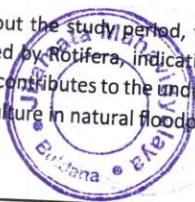
Observation during study period June 2019 to May 2020

Zooplankton	Jun	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	April	May
Cladocera												
Diaphanosoma sp.	+	+	+	+	+	+	+	+	+	+	+	+
Scapholeberis sp.	+	-	-	+	+	+	+	+	+	+	+	+
Ida sp	+	+	+	+	+	+	+	+	+	+	+	+
Simocephalus sp.	+	-	-	+	-	-	-	-	+	-	-	+
Macrothrix sp.	-	+	-	-	+	-	-	+	+	+	+	+
Chydorus sp.	+	+	+	+	+	+	+	+	+	+	+	+
Ceriodaphnia sp.	+	+	+	+	+	+	+	+	+	+	+	+
Bosmina sp.	+	+	+	+	+	+	+	+	+	+	+	+
Bosminopsis sp.	-	-	-	+	-	-	-	-	-	+	-	-
Alona sp.	+	+	+	+	-	+	+	+	+	+	+	+
Alonella sp	+	-	-	-	+	-	-	-	+	-	-	-
Daphnia sp.	-	-	+	+	+	+	-	+	+	+	+	-
Moinodaphnia sp	-	-	-	+	-	-	-	+	-	-	-	-
Moina sp .	+	+	+	+	+	+	+	+	+	+	+	+
Copepod												
Mesocyclops sp.	+	+	+	+	+	+	+	+	+	+	+	+
Thermocyclops sp.	+	+	+	+	+	-	-	+	+			
Neodiaptomus sp.	+	+	+	+	+	+	+	+	+			

Heliodiaptomus sp.	+	+	+	-	+	+	+	-	-	+	+	+
Rotifera												
Brachionus sp.	+	+	+	+	+	+	+	+	+	+	+	+
Polyarthra sp.	-	+	-	+	-	-	-	+	-	-	-	+
Plantionus sp.	+	+	+	+	+	+	+	+	+	+	+	+
Lecane sp.	+	+	+	+	+	-	+	+	+	+	-	-
Lepadella sp.	+	-	-	-	+	-	-	-	-	+	-	-
Keratella sp.	+	+	+	+	+	+	+	+	+	+	+	+
Anuraeopsis sp.	+	+	+	+	+	+	+	+	+	-	+	+
Asplanchna sp.	+	+	+	+	+	+	+	+	+	+	+	+
Ascomorpha sp.	+	+	+	-	+	+	+	+	+	+	+	+
Testudinella sp.	+	+	+	+	+	+	+	+	+	+	+	+
Trichocerca sp.	+	+	+	+	+	+	+	+	+	+	+	+
Cephalodella sp.	+	-	+	+	-	-	+	+	+	+	+	+
Macrochaetus sp.	-	-	+	-	-	-	-	-	+	-	-	+
Mytilina sp.	-	-	-	-	-	-	-	-	-	+	-	-
Horaella sp.	-	-	-	-	+	-	-	-	-	+	-	+
Filinia sp.	+	+	+	+	+	+	-	-	-	+	+	-
Colurella sp.	-	+	+	-	-	-	-	-	+	-	+	+
Conochilus sp.	-	-	-	-	-	+	-	-	-	-	+	+
Rotaria sp.	-	+	-	-	-	-	-	+	-	-	+	+
Scaridium sp.	+	+	+	+	+	+	+	+	+	+	+	+
Pompholyx sp.	-	+	-	-	+	-	-	-	-	+	+	+
Platyias sp.	-	-	-	-	-	-	-	-	-	+	+	+

CONCLUSION

Throughout the study period, the present study on Pentakli Dam indicates a rich and diverse Zooplankton that is dominated by Rotifera, indicating that the wetland is particularly appropriate for aquaculture as Zooplankton. This research contributes to the understanding of Zooplankton diversity in tropical floodplains in general, which is beneficial to aquaculture in natural floodplains in particular



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New Agriculture Acts-2020 and its Impact on APMC & MSP

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Introduction :

In the midst of strong protests from opposition members over their demand for a division of votes on their motion to refer the legislation to a select committee, the Rajya Sabha has passed two primary farm bills. The Upper House passed the Farmer's Produce Trade and Commerce (Promotion and Facilitation) Bill, 2020, by voice vote, and the Price Guarantee and Farm Services Bill Agreement for Farmers (Empowerment and Protection), 2020. The bills have already been passed by Lok Sabha and have now been informed on 27th September, 2020 as legislation. On the other hand, contract farming legislation would enable farmers to enter into a pre-agreed price contract with agribusiness companies or large retailers for their goods. This will assist small and marginal farmers as the law will move from the farmer to the sponsor the risk of market unpredictability. The 2020 Essential Commodities (Amendment) Bill seeks to delete the list of essential commodities such as cereals, pulses, oilseeds, edible oils, onions and potatoes. It implies that, except in exceptional circumstances such as war and natural calamities, the law would do away with the imposition of stock-holding limits on such products.

The three bills that were passed are:

1. The Farmers' Produce Trade and Commerce (Promotion and Facilitation) Bill, 2020.

2. Farmers (Empowerment and Protection) Agreement on Price Assurance and Farm Services Bill, 2020.

3. Essential Commodities (Amendment) Bill, 2020.

These bills were introduced in the Lok Sabha on day one of the Monsoon session (September 14, Monday). The bills replaced the Farmers' Produce Trade and Commerce (Promotion and Facilitation) Ordinance, 2020 promulgated by the President on June 5 this year. **The Farmer's Produce Trade and Commerce (Promotion and Facilitation) Bill, 2020 :**

Benefits:

1. Create an ecosystem where farmers and traders enjoy the freedom to sell and purchase farm produce outside registered 'mandis' under states' APMCs (Agricultural Produce Market Committees).

2. Help farmers in getting better prices through competition, abolishment of market fees and cost-cutting on transportation.

Section 6 states that no market fee or cess or levy, by whatever name called, under any State APMC Act or any other State law, shall be levied on any farmer or trader or electronic trading and transaction platform for trade and commerce in scheduled farmers' produce in a trade area.

3. Promote barrier-free inter-state and intra-state trade of farmers' produce.

Section 3: Subject to the provisions of this Act, any farmer or trader or electronic trading and transaction platform shall have the freedom to carry on the inter-State or intra-State trade and commerce in farmers' produce in a trade area.

4. Provide a facilitative framework for electronic trading.

Section 5 provides framework for electronic trading and transaction platform. The Central Government shall by rules.

(a) Specify the procedure, norms, manner of registration; and

(b) Specify the code of conduct, technical parameters including inter-operability with other

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platform and modalities of trade transaction including logistics arrangements and quality assessment of scheduled farmers' produce and mode of payment, for facilitating fair inter-State and intra-State trade and commerce of scheduled farmers' produce in a trade area.

Drawbacks:

1. States will lose revenue as they won't be able to collect 'mandi fees' if farmers sell their produce outside registered APMC markets.
2. If entire farm trade moves out of mandis the commission agents in states will lose their businesses.
3. Farmers are not trained electronic trading and thus, they shall be highly prone to frauds.

Impact on APMC:

Since the sixties, concerted efforts were made to bring all wholesale markets for agricultural produce under the "Agriculture Produce Market Regulation Act". This included a series of legal instruments for regulating market conduct and trade activities. These legislations, known as APMC acts, were enacted by all the states, except Kerala, Jammu and Kashmir, and Manipur. They mandated that the sale/purchase of agricultural commodities should be carried out in a specified market area and the producer sellers or buyers must pay the requisite market fee, user charges, levies and commissions for the agents as specified under the APMC Act. These charges varied widely across states and commodities.

Initially, a lot of investment was made for the development of regulated markets, and their growth was much higher than that of crop output. Improved infrastructure and APMC regulations helped remove malpractices from markets and created orderly and transparent marketing conditions. This freed the farmers from the exploitative power of middlemen and mercantile capital at the time. Between the mid-nineties and 2006, growth in market infrastructure turned one-fourth of the growth

in output, despite large deficiency existing in the former. After 2006, no growth in mandi infrastructure was reported. This increased the woes of Indian farmers as the market facility did not keep pace with increase in output, and regulation did not allow farmers to sell outside the APMC markets. The farmers were left with no other choice but to seek the help of middlemen in the market and with time, their dependency on them grew. At the same time, commission agents and traders slowly increased their bargaining powers over the farmers by providing them greater access to credit. This, however, led to a system of interlocked transactions that robbed the farmers of the choice to decide whom and where to sell, and subjected them to exploitation by the arthiyas. Another big setback to APMC markets started with states treating them as sources of revenue generation through taxes, cess, and other charges, instead of looking at them as infrastructure service for the farmers. In several states, commission charges were increased without any improvement in the services provided to the sellers/buyers. To avoid any protests from farmers against these high charges, most of them were required to be paid by buyers, like FCI. In Haryana and Punjab, where wheat and paddy sells at or above MSP, mandi fee and rural development charges for these two crops are 4-6 times the charges for basmati rice purchased by private players. The reason is that wheat and paddy are almost entirely purchased on account of FCI, whereas basmati rice is purchased by private players. In all the cases where the produce is not purchased by public agencies, high mandi charges affect farmers as they are factored in the price paid to the sellers by the buyers.

The increase in mandi charges over time and the structure and level of these charges show that the APMC markets, which were created to ensure competitive prices for farm produce and free producers from exploitative



practices of middlemen, have come to be used for revenue generation and rent-seeking under the cover of regulation, and at the cost of producers and consumers. This is against the spirit of APMC regulation and makes such mandis uncompetitive. Only a small fraction of user charges levied as mandi fee, etc., is used for operation and maintenance of the mandis and the rest is mostly spent as political largesse.

The effect of the FPTC Act on APMC mandis will depend upon the treatment meted out to these markets and the charges and levies therein. Of the 25 states having APMC acts, 12 do not charge commission on notified crops. The service charges, like mandi fee for representative crop, in these states vary from 0-1% in 9 states and 2% in Madhya Pradesh and Tripura. There is no threat from the FPTC Act to APMC mandis, in these states, as private traders and sellers will get benefits commensurate with the mandi charges.

The second category of states has Andhra Pradesh, Himachal Pradesh, Maharashtra, and Telangana, where the service charge for mandi is 1% of the value of the produce and the commission varies from 1-2%. Uttarakhand also falls in this category, with 2% mandi fee and 1% commission charge. Karnataka follows these states closely, with total charges at 3.5%. These states can easily bring down their mandi charges to 2% or less by lowering the commission or mandi fee to 1% or below, to keep the business in APMC markets intact.

The third set of states includes Punjab, Haryana, Rajasthan, Gujarat, Arunachal Pradesh, West Bengal, and Uttar Pradesh, where the total charges vary from 5-8.5%, with the highest in Punjab followed by Haryana. Among these states, Punjab and Haryana will not face any challenge from sale outside of mandis as long as paddy and wheat are the dominant crops, and are procured by the government. Ultimately, for the states in this category, market charges and

commissions need to be brought down to 2% or less, as is the case in others and which is reasonable to enable APMC mandis to compete effectively with transactions outside their premises.

The real threat to APMC mandis and their business is from excessive and unjustified charges in these markets. The new FPTC Act will only put pressure on these markets to become efficient and competitive. Discussion with mandis officials revealed that a maximum of 1.5% of the total charges, including market fee and commission, is adequate to maintain and run mandi operations. This will not wean away traders from APMC markets as they will get the benefit of mandi infrastructure, bulk produce in one place and save the cost required for individual transactions outside the market. The states that are really interested in farmers' welfare should do away with unjustified and excessive mandi charges and keep them below the reasonable level of 1.5%. This will ensure coexistence of APMC mandis and private channels permitted under the new Act in a true competitive spirit.

Madhya Pradesh removed commission agents from notified crops during 1985-90, and now buyers like FCI can directly pay farmers. This was found beneficial for both buyers and sellers. Further, Madhya Pradesh is contemplating to reduce mandi fee to 0.5% of the value of the produce.

The decision to avail services of arthiyas should be better left to producers and sellers instead of being necessitating through law. At best, the state government should announce a cap on commission charges rather than fixing them. The MP model of APMC is best for farmers and the farm sector. It ensures no threat to APMC mandis from the new Act.

Impact on MSP :

Fear has been expressed by the leaders of some farmers' unions in Punjab and Haryana that the new Act aims to gradually stop public



procurement through MSP, which will leave the field open to private corporate players considered a threat to farmers. MSP for wheat and paddy will remain a genuine concern for Punjab and Haryana till better crop options are developed. However, linking the continuation of MSP to the new Act has no grounds whatsoever. MSP and procurement are purely administrative decisions. If the government has the intention to change them, it does not require the help of any act or law. The intentions of the incumbent government regarding MSP and procurement should be better judged from its actions. During the last six years, the current government at the Centre has given three major pushes to the MSP regime. One, a new benchmark for MSP, which ensures 50% or higher margin on cost A2+imputed cost of family labor. As a result of which, MSP has moved up to a higher trajectory. Two, much-needed procurement for ensuring MSP expanded to some other crops. To support this, the Centre is now maintaining a buffer stock of pulses. Three, a new scheme, ASHA, was started to extend financial support and share cost/losses to states that pay MSP to farmers for pulses. These moves show the commitment of the Central government towards MSP.

Some estimates suggest that MSP reaches less than 7% of farmers in the country. This is in sync with other evidence that shows the share of socially procured crop output close to 11% in total crop output, and 7% in total agricultural output. This raises the challenge to ensure remunerative prices for the remaining 90% of produce. The underlying intention of the new Act has been to keep the MSP system intact for the produce already benefiting from it and create a policy environment that improves price realization for the remaining produce.

Suggestions have been made to make MSP a statutory price for producers and treat any transaction below it as unlawful. If according legal status will ensure MSP to farmers, then this would be the easiest way for

any government to help farmers get desired prices. This can be done by state governments and does not require Central intervention. Kerala has announced minimum prices for 16 fruit and vegetables on 27 October. Economic theory as well experience indicates that the price level that is not supported by demand and supply cannot be sustained through legal means. This was tried by Maharashtra in 2018 when the Cabinet approved a change in law to send any trader to jail for a year and impose a penalty of Rs 50,000 for not adhering to MSP declared by the government. As open market prices were lower than the (legalized) MSP levels declared by the state, the buyers withdrew from market and farmers had to suffer. The move was soon abandoned. Another example is that of sugarcane, where MSP (fair and remunerative price) is statutory minimum price. When sugar mills (private sector) did not find FRP for sugarcane matching with sugar prices, they stopped buying and crushing sugarcane. A long, protracted battle in court could not offer a solution. Finally, sugar mills were no longer making full payments to sugarcane producers, resulting in the accumulation of arrears running into thousands of crores of rupees every year. On the other side, the new trading Act creates a favorable environment for private buyers to pay MSP as it saves APMC fee, user charges, commission charges and many other costs. This also shows that any move by the states to counter a Central act while keeping market fee, user charges, commissions, cess, etc., intact, will in practice work against private traders giving MSP to farmers by making purchase price costlier.

The new Act has also been criticized by quoting the example of Bihar, which scrapped the APMC Act in 2006. It is argued that freeing trade in Bihar did not help in getting MSP—however, they were not getting MSP even before the scrapping of the APMC Act! Price data from Bihar shows that average farm harvest price for



ten years before the scrapping of the APMC Act was 30% below MSP, which went down to 20% in the following decade. This does not indicate any negative effect on prices received by farmers due to scrapping of the APMC Act. The second, and more serious, flaw in this argument is that the FPTC Act is taken to imply the shutting down of APMC markets. The major difference between what Bihar did and what is proposed in the FPTC Act 2020 is to create one more option for farmers while retaining the option of selling produce in APMC mandis.

As discussed earlier, the best benefit from the new Act will accrue when APMC mandis and private channels coexist and compete. This can be ensured by the states by nurturing APMC mandis as infrastructure service for the farmers—like other government facilities such as hospitals, schools, roads and parks, etc.—rather than using them for generating revenue for the government and middlemen.

It is also pertinent to point out that the mere existence of APMC markets does not ensure MSP, as seen in the case of many crops in Punjab and Haryana and with wheat and paddy in several states. There are also cases of sizable procurement at MSP in states without the APMC Act (20 lakh tons of paddy procured in Bihar and 7 lakh tons in Kerala in 2019–20). Implementation and continuation of MSP is an administrative decision and in the case of rice and wheat it is part of the four pillars of food security, that include (i) procurement, (ii) buffer stock and (iii) PDS in addition to MSP. The system will collapse if one pillar is demolished. No responsible government would like to be seen as doing damage to the system that has served the purpose of food security, price stability, food self-sufficiency so well. The Prime Minister has stated a couple of times that the MSP system will continue after implementation of the new farm acts. The Union Agriculture Minister has even given written assurance in this regard. It is very clear that the running MSP system has

nothing to do with the APMC Act or FPTC Act 2020.

§ Bill on contract farming - The Farmer (Empowerment and Protection) Agreement of Price Assurance and Farm Services Bill, 2020 :

Benefits:

1. Farmers can enter into a contract with agribusiness firms, processors, wholesalers, exporters or large retailers for sale of future farming produce at a pre-agreed price. It is the responsibility of sponsors or the farm service provider for compliance of any legal requirement for providing such farm services.

Section 3 of the bill explains about farming agreement and its period. It also states that the responsibility for compliance of any legal requirement for providing such farm services shall be with the Sponsor or the farm service provider, as the case may be. The minimum period of the farming agreement shall be for one crop season or one production cycle of livestock, as the case may be, and the maximum period shall be five years.

Section 4: of the bill states that the parties entering into a farming agreement may identify and require as a condition for the performance of such agreement compliance with mutually acceptable quality, grade and standards of farming produce.

2. Risk of market unpredictability is shifted from farmers to sponsors as the price of farming produce is predetermined at the time entering into agreement. Farming agreement may

Section 5: of the bill explains that the price to be paid for the purchase of a farming produce may be determined and mentioned in the farming agreement itself and a guaranteed price to be paid for such produce.

3. Ensure risk mitigation and flow of credit to farmer or Sponsor or both by linking farming agreement with insurance and credit instrument.

Section 9: A farming agreement may be linked with insurance or credit instrument under



any scheme of the Central Government or the State Government or any financial service provider to ensure risk mitigation and flow of credit to farmer or Sponsor or both.
4. Effective dispute resolution mechanism with redressal timelines.

Section 13: states that every farming agreement shall explicitly provide for a conciliation process and formation of a conciliation board consisting of representatives of parties to the agreement.

Section 14: states that where, the farming agreement does not provide for conciliation process as required under sub-section (1) of section 13, or the parties to the farming agreement fail to settle their dispute under that section within a period of thirty days, then, any such party may approach the concerned Sub-Divisional Magistrate who shall be the Sub-Divisional Authority for deciding the disputes under farming agreements.

Drawbacks:

1. Farmers in contract farming arrangements will be the weaker players in terms of their ability to negotiate what they need.

2. It will affect the small farmers as many sponsors may not like to deal with a multitude of small and marginal farmers.

3. Being big private companies, exporters, wholesalers and processors, the sponsors will have an edge in entire dealing including in disputes.

4. Farmers who don't know to read and write, chances are there they might get exploited by the sponsors.

5. If the dispute doesn't get resolved within the timelines provided in this bill then it will be the farmers who will be most adversely affected.

6. It may give rise to cash crop and corporates will call the shots. Ultimately subsistence crops will take a beating.

Bill relating to commodities: The Essential Commodities (Amendment) Bill, 2020 :

A new sub-section 1A in Section 3 of the act stipulated control orders — with respect to the supply of certain foodstuffs was added.

It would be issued only under extraordinary circumstances that may include war, famine, extraordinary price rise and natural calamity of grave nature

Benefits:

1. The amendment bill will remove commodities like cereals, pulses, oilseeds, onion and potatoes from the list of essential commodities.

2. allows the central government to regulate the supply of certain food items only under extraordinary circumstances (such as war and famine). Stock limits may be imposed on agricultural produce only if there is a steep price rise.

3. It will remove fears of private investors of excessive regulatory interference in their business operations.

4. It will help to bring investment for farm infrastructure like cold storages, and modernizing food supply chain.

5. Will help both farmers and consumers by bringing in price stability.

6. Will create competitive market environment and cut wastage of farm produce.

Drawbacks:

1. Price limits for "extraordinary circumstances" are so high that they are likely to be never triggered.

2. Big companies will have the freedom to stock commodities- it means they will dictate terms to farmers which may lead to less prices for the cultivators.

Conclusion:

No doubt, the new legislations help farmers by giving them freedom to sell the goods as per their own choice. However, the biggest chunk of Indian farmers are small farmers having no great education or source of income. The legislation may increase the income of farmers



on short term basis, but on long term, the small farmers may end up becoming labourers of big corporates. It is not without a reason that at a couple of places in Bihar the opposition parties in their political rallies are reminding the people of East India Company and Indigo Plantation.

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Rashtriya Krishi Vikas Yojana in India: A Study

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Abstract:

Rashtriya Krishi Vikas Yojana was started in 2007 as an umbrella programme for ensuring holistic development of agriculture and allied sectors by permitting states to choose their own agriculture and allied sector development activities as per the district or state agriculture plan. RKVY aims at making farming a remunerative economic activity through strengthening the farmer's effort, risk mitigation and promoting agri-business entrepreneurship. The National Development Council determined that agricultural development strategies must be reoriented to meet the requirements of farmers and called upon the Central and State governments to evolve a approach to rejuvenate agriculture. The NDC reaffirmed its commitment to achieve 4 per cent annual growth in the agricultural sector during the 11th plan. In this direction, the present study intends to explain the role of RKVY in the agricultural development of Indian economy from 2010-11 to 2019-20.

Key words: Agriculture, Development, Production, Government, Economy, Inclusive.

Introduction:

Slow growth in the Agriculture and allied sectors, National Development Council (NDC), in its meeting held on 29th May, 2007 observed that a special Additional Central Assistance (ACA) Scheme be announced to incentivize States to put together comprehensive agriculture development plans taking into account agro-climatic conditions, natural resources and technology for confirming more inclusive and

विद्यावार्ता: Interdisciplinary Multilingual Refereed Journal | Impact Factor 7.940 (IIJIF)

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Study of Physico-Chemical Parameter of Soil Analysis in Buldana District

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Abstract: Soil is the system which supplies plant with available nutrients through the root. Physical and Chemical analysis of the soil are carried out to indicate the efficiency of soil for supplying plants with nutrients in available forms as well as identification of the factors affecting this efficiency in the soil. Therefore, besides perfect sampling in the field, soil samples must be properly prepared and analyzed in order to reach the correct evaluation of the soil nutritional status. Soil is the mixture of minerals, organic matter, gases and countless organisms that together support plant life. Soil is considered to be the "skin of the earth" with interfaces between the lithosphere, hydrosphere, atmosphere of Earth, and biosphere. Soil consists of a solid phase (minerals and organic matter) as well as a porous phase that holds gases and water. Accordingly, soils are often treated as a three-state system. Soil is the end product of the influence of the climate, relief (elevation, orientation, and slope of terrain), organisms, and parent materials (original minerals) interacting over time. Soil continually undergoes development by way of numerous physical, chemical and biological processes, which include weathering with associated erosion. Most soils have a density between 1 and 2 gram per cubic centimeter.

Keywords: Soil Analysis

I. INTRODUCTION

Soil is the end product of the influence of the climate, relief (elevation, orientation, and slope of terrain), organisms, and parent materials (original minerals) interacting over time. Soil continually undergoes development by way of numerous physical, chemical and biological processes, which include weathering with associated erosion. Most soils have a density between 1 and 2 gram per cubic centimeter¹⁻³.

Soil science has two basic branches of study: edaphology and pedology. Pedology is focused on the formation, description (morphology), and classification of soils in their natural environment, whereas edaphology is concerned with the influence of soils on organisms. In engineering terms, soil is referred to as regolith, or loose rock material that lies above the 'solid geology'. Soil is commonly referred to as "earth" or "dirt"; technically, the term "dirt" should be restricted to displaced soil. Soil is a major component of the Earth's ecosystem⁴. The world's ecosystems are impacted in far-reaching ways by the processes carried out in the soil, from ozone depletion and global warming, to rain forest destruction and water pollution.

Ammonia generated by the production of coke was recovered and used as fertilizer. Finally, the chemical basis of nutrients delivered to the soil in manure was understood and in the mid-19th century chemical fertilizers were applied. However the dynamic interaction of soil and its life forms still awaited discovery⁵.

It was known that certain legumes could take up nitrogen from the air and fix it to the soil but it took the development of bacteriology towards the end of the 19th century to lead to an understanding of the role played in nitrogen fixation by bacteria. The symbiosis of bacteria and leguminous roots, and the fixation of nitrogen by the bacteria, were simultaneously discovered by the German agronomist Hermann Hellriegel and the Dutch microbiologist Martinus Beijerinck. Crop rotation, mechanisation, chemical and natural fertilizers led to a doubling of wheat yields in western Europe between 1800 and 1900.

1.1 Some Important Physical Properties of Soil

All crops practically slow down their growth below the temperature of about 90C and above the temperature of about 500 C and physical properties as Texture, Structure, Density, Porosity, Consistence, Colour

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DOI: 10.48175/IJARSCT-2386

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II. OBJECTIVE

1. To provide a basis for fertilizer recommendations for a given crop.
2. To evaluate the fertility status of the soil and plan a nutrient management program.
3. To provide and index of nutrient availability or supply in given Soil.
4. To predict the probability of obtaining a profitable response to fertilizer application.

2.1 Sample Collection

Sample collected from Lonar is a town and municipal council in Buldana district of vidarbha region of the India state of Maharashtra.. Mostly Agriculture crop is found in lonar village is as follows cotton, soyabean, chilli, jawar, wheat and cotton is one of the most important crops in lonar village. Various type of soil is present in lonar Red soil, lime soil, black cotton soil etc the collected soil samples have been analyzed in Laboratory Systematic collection of soil samples is an important step in soil analysis. These centers are manned by trained and experienced agriculture graduates who help the farmer in systematic collection of soil samples.

Appropriate method of collection of soil sample is as important as the chemical analysis of the soil because all the recommendation regarding the soil is based on the analysis of these samples. The samples collected for the analysis should be truly representing the field. 0.5 to 2 Kg sample is collected for soil analysis and out of this sample only 2 to 5 grams soil is used for analysis. Ten Soil sample is collected from the fields of following farmer

Sr. No.	Name of Farmer	Sample Code
1.	Shashikant Sarkate	S1
2.	Bhaskar Padghan	S2
3.	Vijay Sarkate	S3
4.	Ambadas Pophale	S4
5.	Anna Padghan	S5
6.	Gopal Avachar	S6
7.	Madhav Narvade	S7
8.	Satish Sarkate	S8
9.	Bhagwat Gavali	S9
10.	Ravindra Deshmukh	S10

Location of study area is shown in following maps



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III. EXPERIMENTAL PROCEDURE

3.1 pH

Procedure: Add 25 ml distilled water to 10 g air-dried sample in a beaker 50 ml. Read the suspension temperature by thermometer. Stir at regular intervals for 20-30 minutes. Wash the pH meter electrode with distilled water. Open the contact switch, wait 5 minutes, adjust temperature knob to room temperature. Rinse the electrode with distilled water, then with the soil suspension after stirring. Read the pH value of the soil suspension.

3.2 Electrical Conductivity (EC)

Electrical conductivity is commonly used for measuring the electrical resistance in the solution which indicates the total concentration of ionized constituents in solutions. It is closely related to the sum of the cations and anions in the suspension. Accordingly, it can be used for indicating the salinity in soil extracts. Electric conductivity can be expressed as milliohms/cm in 1:1 soil/water extract.

Reagents: 1- Potassium chloride solution 0.01N; 2- Calcium sulfate dehydrates saturated solution.

Procedures: Extraction: Take 10 g air-dry soil in 100 ml beaker, add 25 ml distilled water Stir for 10 minutes, and repeat stirring 4 times on 30 minutes intervals Measure the suspension temperature by thermometer Read out the electrical conductivity of soil solution

3.3 Total Nitrogen

Reagents:

1. Digestion mixture: Mixture of Potassium sulphate K_2SO_4 and Copper sulphate $CuSO_4 \cdot 5H_2O$. with Selenium. Mixed with proportion of 10: 1: 0.5 respectively.
2. H_2SO_4 conc.
3. NaOH solution (40%).
4. H_3BO_3 solution (4%).
5. 0.01 N HCl
6. Indicator

Procedure:

Weigh 5 g soil into digestion flask add 5 g digestion mixture and 20 ml H_2SO_4 conc. put the flask on digestion board with electric heaters. Heat gradually; low at 10-30 minutes, then raise heating degree. After the end of fuming, the digestion is continued for 1 hour after the solution had cleared with white colour of digestion mixture. Transfer the sample to 250 ml volumetric flask; complete the volume with dist. Water.

Distillation: Put 20 ml H_3BO_3 in Erlenmeyer flask and 4 drops of the indicator.

Put the flask so that the lower tip of the glass receiver tube is below the boric acid surface. Start running the cooling water in condenser boils the water in the boilers. Put 25 ml of the sample in the funnel with dist. Water. Released ammonia is trapped in boric acid.

Titration: Ammonia is titrated with HCl or H_2SO_4 . At end point the green colour just disappears.

Calculation

$$N \% \text{ in soil} = \frac{(\text{sample titration} - \text{blank}) \times \text{normality} \times 14 \times \text{dilution}}{\text{sample weight}}$$

3.4 Soil Organic Matter

Reagents: H_3PO_4 85%, H_2SO_4 concentrated (96%), NaF, Standard 1N $K_2Cr_2O_7$, 0.5 N Fe^{++} solution The Fe^{++} in this solution oxidizes slowly on exposure to air so it must be standardized against the dichromate daily. Ferrou indicator:

Procedure: Weigh out 1 to 2g dried soil (< 60 mesh) and transfer to a 500 ml Erlenmeyer flask. The sample should contain 10 to 25 mg of organic C (17 to 43 mg organic matter). For a 1 g sample, this would be 1.2 to 4.3% organic matter. Use up to 2.0 g of sample for light colored soils and 0.1 g for organic soils.

2- Add 10 ml of 1 N $K_2Cr_2O_7$ by means of a pipette. Add 200 ml of concentrated H_2SO_4 by means of dispenser and swirl gently to mix. Allow to stand 30 minutes. The flasks should be placed on an asbestos sheet during this time to avoid rapid loss of heat. Dilute the suspension with about 200 ml of water to provide a clearer suspension for viewing the endpoint.

3- Add 10 ml of 85% H_3PO_4 , using a suitable dispenser, and 0.2 g of NaF, using the spatula. The H_3PO_4 and NaF are added to complex Fe^{3+} , which would interfere with the titration endpoint. Add 10 drops of ferroin indicator.

4- Titrate with 0.5 N Fe^{++} to a burgundy endpoint. The color of the solution at the beginning is yellow-orange to dark green. The reagent blank is used to standardize the Fe^{++} solution daily. Calculate % C and % organic matter

% easily oxidizable organic C

$$C = \frac{(B-s) \times n \times Fe^{++}}{gm\ of\ soil} \times \frac{12}{4000} \times 100$$

Where: B = ml of Fe^{++} solution used to titrate blank,

S = ml of Fe^{++} solution used to titrate sample, and 12/ 4000 = mill equivalent

3.5 Moisture Content

Procedure: Weigh 5.00 g of air-dry soil < 2 mm into a previously dried (at 105°C) and weighed weighing dish with lid (a labeled aluminum dish) fit lid, cool in a desiccators for at least 30 minutes and reweigh. All Weighing should be recorded to 3 decimal places.

Calculation:

$$\% \text{ moisture} = \frac{\text{wet soil (g)} - \text{Dry soil (g)}}{\text{dry soil}} \times 100$$

3.6 Chloride - Reagents

A. Potassium Chromate, Silver Nitrate Solution ($AgNO_3$) 0.01N NaCl, 0.01 N

Procedure: Pipette 5-10 ml soil saturation extract into a wide-mouth porcelain Crucible or a 150-ml Erlenmeyer flask. Add 4 drops potassium chromate solution.

Titrate against silver nitrate solution until a permanent reddish-brown color appears. Always run two blanks containing all reagents but no soil, and treat them in exactly the same way as for the samples. Subtract the blank titration reading from the readings for all samples.

Calculation

$$Cl \text{ (meq/L)} = \frac{(V - B) \times N \times R \times 1000}{Wt}$$

3.7 Water Holding Capacity

Procedure:

Weight accurately 20 gm of soil sample on the balance transfer this soil on the whatmann's filter paper and kept this soil in funnel then on the measuring cylinder pour 40 ml of water into the soil sample. Keep this experiment stay for one night. Then observe how much of water is come down from soil sample in measuring cylinder accurately weight the wet soil with filter paper and subtract weight of filter paper from wet soil. Then calculate the water holding capacity by the using below formula

WHC = weight of wet soil – weight of taken soil

IV. RESULT AND DISCUSSION

1. Temperature of Soil sample was found to be 28.9 to 34.7
2. Colour of Soil sample found to be Black, Lime and Red.
3. The amount of pH present in the Soil sample was found to be in between range of 6.2 to 8.32
4. The amount of chloride ion present in the Soil sample was found to be in between 0.047 to 0.093 meq/L.

Sr. No	Name of Parameters Name of Farmers	Water Holding Capacity (ml/20gm)	Moisture Content (%)	Chloride (mg/L)
1	Shashikant Sarkate	7.2	4.1	0.063
2	Bhaskar Padghan	5.6	5.2	0.065
3	Vijay Sarkate	11.4	3.0	0.089
4	Ambadas Pofale	3.2	6.3	0.047
5	Anna Padghan	9.9	3.8	0.068
6	Gopal Avachar	8.9	8.6	0.071
7	Madhav Narvade	10.8	3.0	0.088
8	Satish Sarkate	7.4	7.5	0.070
9	Bhagwat Gavali	13.2	6.3	0.093
10	Ravindra Deshmukh	6.5	7.5	0.059

Sr. No.	Name of Parameters Name of Farmers	E.C. (ms)	Nitrogen (%)	PH	Organic carbon (%)
1	Shashikant Sarkate	0.361	2.88	7.20 at 23 ⁰ C	3.62
2	Bhaskar Padghan	0.374	3.39	6.45 at 23 ⁰ C	2.7
3	Vijay Sarkate	0.938	2.33	7.46 at 23 ⁰ C	3.38
4	Ambadas Pofale	0.376	2.28	6.82 at 23 ⁰ C	2.99
5	Anna Padghan	0.382	3.80	7.33 at 20 ⁰ C	4.0
6	Gopal Avachar	0.420	4.03	8.32 at 29 ⁰ C	2.47
7	Madhav Narvade	0.461	2.03	8.07 at 28 ⁰ C	3.29
8	Satish Sarkate	0.377	3.25	6.2 at 23 ⁰ C	3.1
9	Bhagwat Gavali	0.936m	2.75	7.98 at 20 ⁰ C	2.89
10	Ravindra Deshmukh	0.376	4.02	8.08 at 23 ⁰ C	3.09

V. CONCLUSION

The study of soil is mostly based on the following parameter of soil which is as follows

A) Texture B) Fertility C) Colour D) Moisture E) Water holding capacity

Soil analysis of Lonar village I found that soil of Lonar village is blackish & red in nature which posses good water holding property & moisture as well as organic carbon Beyond that I also found soil of Lonar village has necessary Nitrogen From the above point we can assume that the soil of Lonar village has good fertility for the following crops Soyabean, Wheat, Blackgram, Greengram, Cotton

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✓ 2021-22

Diversity of Mycoflora in Some Stored Oil Seeds

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Abstract— The present study was undertaken to various types of stored oil seeds. Surveyed the storage oil seeds in all thirteen talukas of Buldhana district and collected oilseeds from APMC markets, warehouses and farmer households for further study. Seed-borne fungus were isolated from edible oil seeds Soybean (*Glycine max* (L) Merr.), Mustard (*Brassica campestris* L.), Sesame (*Sesamum indicum* L.), Niger (*Guizotia abyssinica* L.), and non-edible oil seeds Castor (*Ricinus communis* L.) and Flax or Linseed (*Linum usitatissim* L.). All of the seed samples were visually inspected, and the presence of seed mycoflora was determined using the procedures by moist blotter plate method, Potato dextrose agar method, Water agar and Deep freezing methods were used for detection of seed-borne fungi of storage oil seeds. The fungi *Fusarium oxysporum*, *Penicillium chrysogenum*, *Alternaria dianthicola*, *Penicillium digitatum*, *Trichoderma viride*, *Alternaria alternata*, *Alternaria brassicola*, *Aspergillus flavus*, *Aspergillus niger*, *Cercospora sesani*, *Curvularia lunata*, *Fusarium moniliforme*, *Fusarium solani*, *Rhizopus nigricans* and *Penicillium spp.* were isolated from various stored oil seeds.

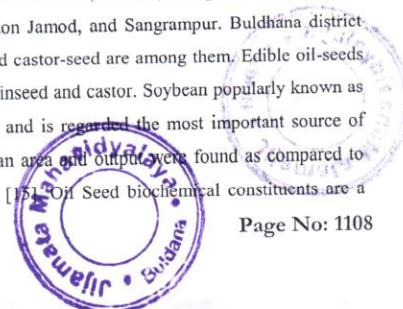
Keywords— Oil seeds, Abnormal oil seeds and Storage fungi.

I. INTRODUCTION

India one of the greatest producer of oilseeds in world. Oil seeds are considered the backbone of the Indian economy. India is responsible for 12-15 percent of the oilseeds area in world, 7-8 percent of oilseed output, 6-7 percent of vegetable oil production, 9-12 percent of vegetable oil imports, and 9-10 percent of edible oil consumption. After the United States, China, and Brazil, India is the world's fourth largest oil seed producer, accounting for around 10% of global oilseed production. The country's unique agro-ecological conditions are ideal for cultivating nine annual oilseed crops, including seven edible oilseed crops. After China, India is the second greatest producer of groundnuts and after China and Canada, India is the third largest producer of rapeseed. In terms of key oilseeds, India ranks first in groundnut production, second in rapeseed-mustard production, and fifth in soybean production. Oilseed crops account for a sizable share of agricultural GDP. The agricultural economy is the world's largest, covering 38 million hectares and producing around 32 million tonnes of oilseeds [9]. Soybean was the most widely grown oilseed in the country in 2020, with over 12 million metric tonnes production. Seeds in the field and in storage condition interact with a variety of bacteria that infect the seeds and have a qualitative and quantitative impact [5]. Oilseeds contain oils and fats that can be used as food fats or as a raw material in industry. Some oilseeds and cakes include proteins that are suitable for human consumption, while others are utilised as animal feed. Oilseeds also contain carbohydrates, vitamins, and minerals [4]. Maharashtra is one of India's most important oilseed producing states. Maharashtra state is a leader in the area and output of oilseed crops grown in the United States. Seeds for making oil in 2016, Maharashtra produced 2.375 thousand metric tonnes. The largest soybean-producing states are Maharashtra and Madhya Pradesh. Soybean agriculture in Maharashtra is centred in two regions (Vidarbha and Marathwada) in the eastern half of the state, as it is a major soybean producing state with better production. These regions contribute around 80% of the state's soybean production [15]. Buldhana district is the research area of present investigation. It comes in Maharashtra's Amravati division. It is found on the western edge of the Vidarbha region. Buldhana district is divided into thirteen talukas (tehsils). The warehouses of Buldhana urban are located in many other places in Maharashtra. These are used by farmers for storing oil seeds as well as other grains. There were survey of various type of oil seeds, which stored at warehouses, market, farmer houses and retailers from tehsil Buldhana, Chikhli, Deulgaon Raja, Sindkhed Raja, Malkapur, Mehkar, Lonar, Motala, Nandura, Khamgaon, Shegaon, Jalgaon Jamod, and Sangrampur. Buldhana district grows a variety of oil-seeds. Groundnut, linseed, sesame, rapeseed, mustard, and castor-seed are among them. Edible oil-seeds include groundnut, soybean, and sesame; whereas non-edible oil-seeds include linseed and castor. Soybean popularly known as the "wonder bean," accounts for about 60% of total world oilseed production and is regarded the most important source of protein and oil. According to the study, the biggest annual increases in soybean area and output were found as compared to other oil seeds in Buldhana district, at 33.02 and 32.86 percent, respectively [15]. Oil Seed biochemical constituents are a

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significant element that influences seed physiological soundness. Seed biochemical features such as glucose, protein, and oil content declined as storage progressed, whereas free amino acid, free fatty acid, and electrical conductivity increased [1]. After post harvested oil seeds are not stored properly FUNGI, bacteria, viruses, nematodes can grow on them which can damage the seeds and affect germination, purity, vigour etc. In India, 60 percent of health problems are caused by those who do not consume high-quality edible oil on regular basis fungal infections are commonly observed in stored seeds. These are to blame for the decrease of oil seed quantity and quality. Understanding the epidemiological conditions, on the other hand, can aid in disease control. Soybean, mustard and sesame are the most common oil seeds in the district. The oil seeds are infected with fungi, resulting in a significant loss of output. Currently, there is a lot of research is going on fungal diseases.

II. MATERIAL AND METHODS

Oil seeds are harmed as a result of improper handling and poor storage conditions. The Fungi influence and degrade the quality of seeds throughout this process. In this case, fungus isolation tests were carried out.

1. Survey and Collection of oil seed samples

Soybean, mustard, sesame, niger, castor, and flax seed survey was carried out and samples were gathered from APMC Market, warehouses, Retail Shop, Farmer houses and private residences from thirteen talukas in Buldhana district. Cloth bags were used to store seeds. The pre-sterilized cloth bags kept in plant pathology laboratory at room temperature for further studies.

TABLE I
OIL SEED SAMPLES COLLECTED IN BULDHANA DISTRICT, MAHARASHTRA.

Sr. No.	Area of collection	Source of collection				Total sample
		APMC Market	Warehouses	Retail Shop	Farmer houses	
1	Buldhana	2	2	-	-	4
2	Chikhali	1	2	-	-	3
3	Deulgaon Raja	1	1	-	2	4
4	Sindkhed Raja	1	1	1	1	4
5	Mehkar	-	1	1	1	3
6	Lonar	1	1	-	-	2
7	Motala	1	1	1	-	3
8	Malkapur	2	2	-	-	4
9	Nandura	1	1	-	-	2
10	Jalgaon jamod	1	-	-	1	2
11	Khamgaon	2	2	-	-	4
12	Shegaon	1	1	-	-	2
13	Sangrampur	1	1	-	-	2
Total		15	16	3	5	39

2. Isolation of Fungi:

A. Moist blotter plate method:

(The blotter method was developed by Doyer in 1938 which was later included in the International seed Testing Association (ISTA) rules of 1966). In moist blotter plate method white blotter papers was jointly soaked in sterile distilled water and placed in pre-sterilized Petri-plates of 10 cm diameter. Ten seeds were aseptically put at equal distances on moist blotter paper. The plates were incubated at room temperature at aseptic condition for seven days. On eight day, the seeds were examined under microscope for the preliminary determination of seed mycoflora. The seed-borne fungus detected on each seed were extracted and identified, then cultured in pure cultures and kept on PDA (Potato Dextrose Agar) slants for further studies [2].



B. Potato Dextrose Agar (PDA)

In Northern Ireland Muskett and Malone (1941), first time used this method for seed health testing of flax seeds. Peeled 200gm potatoes were boiled until soft and pass through muslin cloth. Then 20gm dextrose powder was added in it and final volume was made up to 1000 ml in borosil beaker. In this 20gm agar was added and pH was adjusted to 5.6.

C. Water agar method

For the agar plate procedure, 100 seeds were sterilised for 3 to 4 minutes in a 0.2 percent sodium hypo chloride solution. Seeds were plated on sterilised glass Petri plates with water agar medium (2.5 percent, i.e. 12.5 gms in 1000ml distilled water). These Petri plates were incubated for seven days at 26±2°C. These seeds were studied under a stereo binocular microscope after seven days [7].

D. Deep freezing method

The method has been recommended by ISTA (1966). Three layers of sterilized blotter were jointly soaked in sterilized distilled water. Petri dishes sterilized in autoclave. Blotter kept in sterilized petridishes. The oil seeds were sterilized by emerging in mercuric chloride solution (0.1%) for 25 sec and simultaneously rinsing for 2 to 3 times in sterilized distilled water. Oil Seeds were placed at the rate of 20 seeds per plate on moistened blotter. Petridishes were incubated at 23±1°C for 24 hrs under 12hrs alternating cycle of near ultraviolet (NUV) light and darkness, for next 24 hrs. Then plates were incubated at -20°C in dark and keep black under original condition for the next 8 days. After eight days of incubation, seeds were examined with the help of stereoscopic binocular microscope.

III. RESULTS AND DISCUSSION

Survey of oil seeds was carried out and samples were collected from each geographical areas under study comprising of thirteen talukas belongs to six sub-divisions of Buldhana districts and screened for prevalence of seed borne mycoflora. In the entire district found that soybean oil seeds have the highest storage compared to other oilseeds, followed by mustard and sesame. Oil seeds such as nigar, castor, and linseed are also rarely kept in market places or warehouses. Table II shows fungi found in Soybean (*Glycine max* (L) Merr.) Mustard (*Brassica campestris* L.), Sesame (*Sesamum indicum* L.), Niger (*Guizotia abyssinica* L.), and non-edible oil seeds Castor (*Ricinus communis* L.) Flax or Linseed (*Linum usitatissimum* L.).

TABLE III
FUNGI DETECTED FROM OIL SEEDS

Sr.No.	Isolated Fungi	Soybean	Mustard	Sesame	Niger	Castor	Flax or Linseed
1.	<i>Aspergillus niger</i>	+	+	-	+	+	+
2.	<i>Aspergillus flavus</i>	+	+	-	+	+	+
3.	<i>Alternaria alternate</i>	+	+	+	+	+	-
4.	<i>Alternaria dianthicola</i>	+	-	+	-	-	-
5.	<i>Alternaria brassicol</i>	-	-	+	-	-	-
6.	<i>Cercospora sesani</i>	-	+	+	-	-	-
7.	<i>Curvularia lunata</i>	+	-	+	-	-	-
8.	<i>Fusarium moniliforme</i>	-	-	-	-	-	-



9.	<i>Fusarium oxysporum</i>	+	+	+	-	-	+
10.	<i>Fusarium solani</i>	-	+	-	-	+	+
11.	<i>Penicillium spp.</i>	+	+	-	-	-	+
12.	<i>Penicillium chrysogenum</i>	+	-	-	-	+	-
13.	<i>Penicillium digitatum</i>	-	+	-	-	-	+
14.	<i>Penicillium Citratum</i>	-	-	+	-	-	+
15.	<i>Rhizopus nigricans</i>	-	+	+	+	-	-

(+ = Present, - = Absent)

The results presented in the Table noII shows that, *Fusarium oxysporum*, *Penicillium chrysogenum*, *Alternaria dianthicola*, *Penicillium digitatum*, *Trichoderma viride*, *Alternaria alternata*, *Alternaria brassicola*, *Aspergillus flavus*, *Aspergillus niger*, *Cercospora sesani*, *Curvularia lunata*, *Fusarium moniliforme*, *Fusarium solani*, *Rhizopus nigricans* and *Penicillium spp* these fifteen seed-borne fungi were detected in storage oil seeds. Different type of fungi were found in soybean, mustard and sesame oil seeds in maximum quantity and The least common type of fungi is in the niger oil seeds. *Aspergillus flavus*, *Aspergillus niger*, *Alternaria alternata* these three fungi are dominant in oil seeds mycoflora. While *Alternaria brassicola* and *Fusarium moniliforme* these two fungi were found rarely. *Aspergillus niger* and *Aspergillus flavus* are two fungi common in soybean, mustard, niger, castor and flaxseed but not found in sesame seeds. A fungal population of 29 species representing 15 genera have been isolated on both blotter paper and agar plate included *Alternaria alternata*, *A. flavus*, *A. fumigatus*, *A. niger* [3]. Its storage on marginal conditions is highly affected by storage fungi [13]; reported *Aspergillus niger*, *A. flavus*, *Alternaria alternata*, *Alternaria sp.*, *Rhizopus nigricans* and Septate sterile fungal mycelium to be associated with the niger seeds and seed storage rots caused by species of *Aspergillus*, *Penicillium* and *Fusarium* also studied by Rakesh k et. al. [12]. *A.niger*, *A.flavus*, and *Rhizopus nigricans* are found in niger oil seeds also reported by O. Nagarajal et.al. [8]. *Alternaria dianthicola* fungi were isolated in soybean and sesame in marathwada [10]. *Alternaria brassicola* and *Fusarium moniliforme* fungi were found in only sesame oilseeds, this fungi also reported by Tanmay Ghoshl et.al [14]. *Fusarium moniliforme* fungi was also found in oil seeds of sunflower reported by El-Wakil, D. A.et.al [6]. Seed abnormalities caused by fungi include discoloured seeds, damaged seeds, shrunken seeds, undersized seeds, and rotting seeds [11].



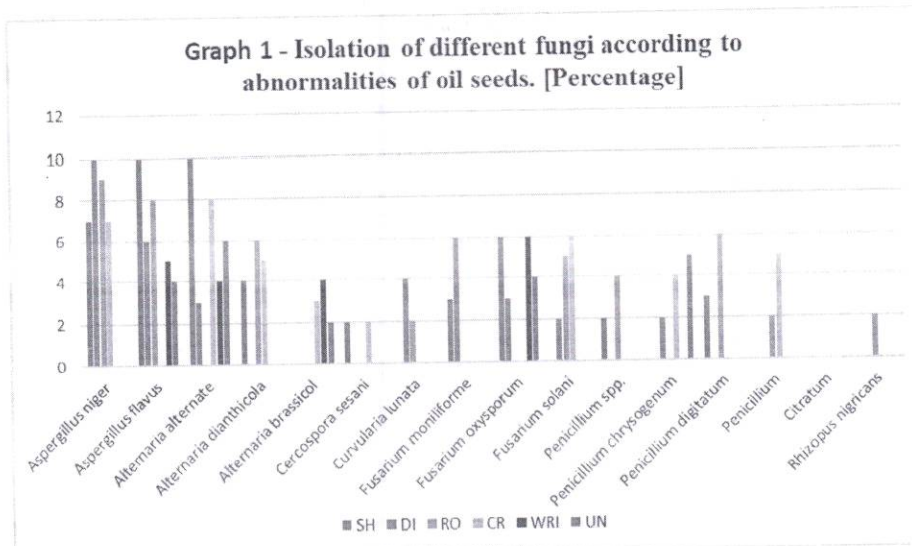
TABLE III

ISOLATION OF DIFFERENT FUNGI ACCORDING TO ABNORMALITIES OF OIL SEEDS.

Fungi	Abnormality (percentage)					
	SH	DI	RO	CR	WRI	UN
<i>Aspergillus niger</i>	07	10	09	07	-	-
<i>Aspergillus flavus</i>	10	06	08	-	05	04
<i>Alternaria alternate</i>	10	03	04	08	04	06
<i>Alternaria dianthicola</i>	04	-	06	05	-	-
<i>Alternaria brassicol</i>	-	-	-	03	04	02
<i>Cercospora sesani</i>	02	-	-	02	-	-
<i>Curvularia lunata</i>	-	04	02	-	-	-
<i>Fusarium moniliforme</i>	03	06	-	-	-	-
<i>Fusarium oxysporum</i>	06	03	-	-	06	04
<i>Fusarium solani</i>	-	02	05	06	-	-
<i>Penicillium spp.</i>	02	-	04	-	-	-
<i>Penicillium chrysogenum</i>	-	02	-	04	-	05
<i>Penicillium digitatum</i>	03	-	06	-	-	-
<i>Penicillium Citratum</i>	-	-	02	05	-	-
<i>Rhizopus nigricans</i>	-	-	02	-	-	-

SH-Shrunkened; DI- Discolored; RO- Rotted; CR- Cracked; WRI-Wrinkled; UN-Undersized.





SH-Shrunkened; DI- Discoloured; RO- Rotted; CR- Cracked; WRI-Wrinkled; UN-Undersized.

The occurrence of different fungus was screened in the Shrunkened, Discoloured, Rotted, Cracked, Wrinkled, and undersized categories, and the findings are shown in table no III. Rotted oilseeds have the highest percentage of fungi at fifty-nine percent of the total and the seeds of this deformity contain ten type of fungi. Eight fungus found in discolored type, also twenty fungus were found in the discolored group [10]. In abnormal oil seeds with Shrunkened, discoloured and rotted in more dominant fungus. *Alternaria alternate* fungus found in all abnormalities while *Rhizopus nigricans* this fungus in only rotted type of seeds. In wrinkled, seeds contain the lowest percentage of fungi.

IV. CONCLUSION

The findings of this study revealed that mycoflora differed from one location to the next. Due to a change in the weather conditions that existed at the time development, harvesting and storage of seeds. Post harvested oilseeds; they are stored in different ways. Depending on the environment, different microorganisms grow on them. Fungi mainly found in the storage condition. The standard blotter and Potato Dextrose Agar (PDA) approach was found to be better to the other two methods for detecting seed mycoflora. Fifteen different types of fungi were isolated from the seed samples. *Aspergillus flavus*, *Aspergillus niger*, and *Alternaria alternate* were found to be the most common in all method of isolation. In abnormality of seeds, In case of abnormal seeds, more type of fungi were found on rotten seeds and less types of fungi were found in wrinkled seeds.



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Jijamata Mahavidyalaya
Buldhana



The International Journal of Analytical and Experimental Modal analysis

An UGC-CARE Approved Group - II Journal

An ISO : 7021 - 2008 Certified Journal

ISSN NO: 0886-9367 / web : <http://ijaema.com> / e-mail: submitijaema@gmail.com



Certificate of Publication

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“Diversity of Mycoflora in Some Stored Oil Seeds”

Authored by :


A. T. More

From

Jijamata Mahavidyalaya, Buldhana (M.S.) India-443001

Has been published in

IJAEMA JOURNAL, VOLUME XIII, ISSUE VIII, AUGUST-2021


Principal
Jijamata Mahavidyalaya
Buldhana



T. A. Olszewski

Michal A. Olszewski Editor-In-Chief
IJAEMA JOURNAL



<http://ijaema.com/>



MAH MUL/03051/2012
ISSN: 2319 9318

Vidyawarta®
Peer-Reviewed International Journal

July To Sept. 2021 | 01
Issue-39, Vol-11

MAH/MUL/ 03051/2012

ISSN :2319 9318



July To Sept.2021
Issue 39, Vol-11

Date of Publication
01 Sept. 2021

Editor

Dr. Babu g. Gholap

(M.A.Mar.& Pol.Sci.,B.Ed.Ph.D.NET.)

विद्येविना मति गेली, मतीविना नीति गेली
नीतिविना मति गेली, मतिविना वित्त गेले
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"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 Babu 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

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Date of Publication
01 Sept. 2021

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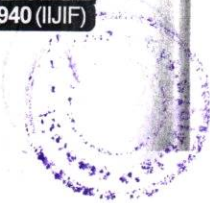
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सामान्यतः एखाद्याचे नाव अजरामर होते, ते कर्तृत्वामुळेच होत असते. रामचंद्रपंत अमात्य यांचे कर्तृत्व मराठा राज्यात महत्वाचे असेच होते. इ. स. १६५० मध्ये जन्मलेले रामचंद्रपंत वयाच्या १८ व्या वर्षी म्हणजेच इ. स. १६६८ मध्ये शिवाजी महाराजांच्या कृपेने मराठा राज्याच्या सेवेत सिंधुदुर्गचे सबनीस म्हणून दाखल झाले. त्यांच्या वडिलांचा शिवाजी महाराज व शिवाजी महाराजांचे घराण्याशी जवळचे आणि विशासाचे संबंध होते. पण केवळ त्यासंबंधावर रामचंद्रपंताचा उत्कर्ष व्हावा व त्यांनी आयुष्याच्या अखेरपर्यंत म्हणजेच इ. स. १७१६ पर्यंत मराठी राज्याची सेवा करावी, असे काही अवलंबून नव्हते त्यासाठी त्यांच्या स्वतःच्या कर्तृत्वाची जोड हवी होती. आणि ते उदं कर्तृत्व त्यांनी इ. स. १६६८ ते इ. स. १७१६ दरम्यानच्या जवळ-जवळ ४८ वर्षांच्या कारकीर्दीत सिद्ध केले म्हणून मराठा इतिहासात त्यांचे नाव एक कर्तृत्ववान व्यक्त नात्याने चिरंतन झालेले आहे.

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२	बाळसाहेब शि. म.	संघ. कुळाजी अनंत महादजी बघर, छत्रपती श्री शिवाजी महाराजांच्या अखेरच्या प्रवासाला, पुणे येथील अखुली १९७३	१११-११२
३	गौरी रा. म.	श्री अमात्य संस्मान बाबट्टा यांचे वसवून १९१६	२६
४	सकनीस के. गो.	श्री अमात्य बाबट्टा यांचा भाग १ला नगरबाळ, संघा. कोल्हापूर १९३७	
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१२	गौरी रा. म.	सकनीस के. गो. अशासन सिटीयुक्त स्टॉल पुणे सन १९६०	८२
१३	Sardesai G.S.	New History of the Marathas Vol 1. Phoenix publication, Bombay 1971	२३८-२३९
१४	गौरी रा. म.	श्री अमात्य संस्मान बाबट्टा यांचे वसवून १९१६	२९
१५	Sardesai G.S.	New History of the Marathas Vol 1 Phoenix publication, Bombay 1971	२३७-२३९
१६	कुलकर्णी क. अ.	छत्रपती शिवाजी महाराजांच्या अखेरच्या प्रवासाला, पुणे सन १९६७	४३०
१७	Takshav N. S.	Life of Shivaji Vol 2 Sunita publication, Delhi	४२५-४२६
१८	गौरी रा. म.	श्री अमात्य संस्मान बाबट्टा यांचे वसवून १९१६	२९
१९	बाळसाहेब शि. म.	संघ. कुळाजी अनंत महादजी बघर, छत्रपती श्री शिवाजी महाराजांच्या अखेरच्या प्रवासाला, पुणे येथील अखुली १९७३	११०

इतिहास संशोधक यादव माधव काळे

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स्वातंत्र्य मिळविण्यासाठी भारतीय जनतेने विविध प्रकारचे आंदोलने केलीत. राष्ट्रीय पुढाऱ्यांच्या दैन्यांमुळे ही आंदोलने यशस्वी झालीत. राष्ट्रीय पुढाऱ्यांच्या दैन्यांमुळेच विदर्भातील प्रत्येक जिल्ह्यात राजकीय व सामाजिक जागृती घडून आली. राष्ट्रीय सभेचे संस्थापक अॅलन हयुम (1888), सुरेंद्रनाथ बॅनर्जी (1897), लो. टिळक (1902-03, 1908, 1908), अलीबं धु (1920-1921), म. गांधी (1920, 1927, 1933) 1940 & 1942), बॅ. चित्तरंजनदास (1922), लाला लजपतराय (1927), राजगुरु (1929-1930), सरदार वल्लभभाई पटेल (1931), कमलादेवी चटापोध्याय (1933), खान अब्दुल गफारखान (1934), डॉ. राजेंद्रप्रसाद (1935), आचार्य कश्यपलानी (1935), श्रीमती सुचितादेवी कृपलानी (1936), व्ही. आर. पंतलू (1937), सेनापती बापट (1938), डॉ. एम. एन. रॉय (1938), सुभाषचंद्र बोस (1939), बा. ग. खेर (1940), वि. दा. सावरकर (1941), राष्ट्रसंत तुकडोजी महाराज (1941), डॉ. हसन (1946), मेजर जनरल शहानवाज खान (1946), इ. राष्ट्रीय स्तरावरील नेत्यांनी विदर्भा-वन्हाडच्या भूमित दौरे केले. नेत्यांच्या या दैन्यांमुळे राजकीय व सामाजिक क्षेत्रात जागृती घडून आली. यातून राजकीय व सामाजिक क्षेत्रात काम करणाऱ्या तडफदार नेतृत्वाचा उदय झाला. यातूनच थोर इतिहास संशोधक यादव माधव काळे उर्फ अणासाहेब काळे यांचेही पुढारीपण विदर्भात पुढे आले. विदर्भाचे सरदेसाई म्हणून प्रसिध्द असणारे थोर इतिहास संशोधक यादव माधव काळे उर्फ अणासाहेब काळे यांचा जन्म बुलडाणा जिल्ह्यातील लोणार येथे झाला. गांधी युगातील बुलडाणा जिल्ह्यातील एक

विद्यावार्ता: Interdisciplinary Multilingual Refereed Journal Impact Factor 7.940 (IJIF)

Principal
Jijamata Mahavidyalaya
Buldana



अग्रगण्य नेतृत्व यादव माधव काळे हे होते. ते विदर्भातील ख्यातनाम संशोधक व इतिहासकार होते. त्यांचा जन्म दि. २८-२-१८८१ रोजी एका साधारण कुटुंबात लोणार येथे झाला. त्यांचे प्राथमिक शिक्षण लोणार व नंतर माध्यमिक शिक्षण मेहकर येथील अँग्लो व्हर्न्युकुलर शाळेत झाले. आठवी ते मॅट्रिक पर्यंतचे शिक्षण त्यांना अकोला येथे घ्यावे लागले. कुशाग्र बुद्धी व दांडगी स्मरणशक्तीचे या.मा. काळे यांनी आपल्या शिक्षवृत्तीतून पुढील शिक्षण पूर्ण केले. यानंतर त्यांनी सुरुवातीला सिव्हील सर्जन ऑफीसमध्ये नोकरी केली. व नंतर मेहकर येथे १८९८ साली शिक्षकाची नोकरी पत्करली. शिक्षकाचा व्यवसाय सांभाळून त्यांनी कलकत्ता व प्रयाग विद्यापीठाच्या इंटर व बी.ए. च्या परीक्षा उत्तीर्ण केल्या. वर्षा येथे बदली झाल्यानंतर त्यांनी नागपूर येथे आपले कायद्याचे शिक्षक पदाचा गजीनामा देवून १९१० पासून त्यांनी मेहकर येथे वकीलीस सुरुवात केली. वकीलीचे कार्यक्षेत्र वाढवित ते १९१९ मध्ये बुलडाणा येथे स्थलांतरीत झाले. त्यांचे शिक्षण मेहकर येथे झाले. त्यांनी बी.ए.एल.एल.बी केले होते. यातूनच ते राजकीय व सामाजिक क्षेत्रात सक्रीय झाले. त्यांनी स्वताच्या वकीलीच्या व्यवसायाकडे दुर्लक्ष करून १९२३ ते १९३७ पर्यंत मध्यप्रदेश कायदे कौन्सिलचे सभासद राहिले. विदर्भाचे अनेक प्रश्न त्यांनी मांडले.

जेव्हा म. गांधींनी असहकार आंदोलनाला सुरुवात केली तेव्हा विदर्भात मोठ्या प्रमाणात जनजागृती झाली. या चळवळीत वकील, डॉक्टर, व्यापारी, इ. वर्गातील तसेच सर्व जाती-जमातीतील सर्व सामान्य जनतेने सहभाग दर्शविला. यातूनच, या. मा. काळे, सारख्या कर्तृत्वान नेतृत्वाचा उदय १९२० नंतर म्हणजे गांधी युगात झाला. या सर्वांनी झंझावती दौरे करून राजकीय व सामाजिक क्षेत्रात भरीव कामगिरी केली. आपले विचार सामान्य जनतेपर्यंत पोहचविले.

मॅट्रिक-चेम्सफोर्ड सुधारणा योजनेनुसार, कौन्सिल प्रवेशासाठी या. मा. काळे यांनी आपला उमेद्वारी अर्ज भरला. परंतु म.गांधींच्या असहकाराचे त्यांच्या कार्यक्रमाला सन्मान देण्यासाठी त्यांनी आपला अर्ज मागे घेतला व वन्हाडातील पुढ्यांना कौन्सिल प्रवेश मान्य असुनही म. गांधींच्या असहकार कार्यक्रमाला

मनापासून पाठींबा होता. या.मा. काळे यांनी देखील कायदेमंडळावरील बहिष्कार मान्य केला. राष्ट्रीय चळवळीच्या प्रवाह पाहून या.मा. काळे आपली उमेद्वारी मागे घेवून कौन्सिल बहिष्काराचे तत्व मान्य केले.

असहकार चळवळीच्या काळात सरकारने आपले दमन नीतीचे चक्र जोराने फिरविले. अशावेळी भिकमसिंह क्षत्रिय यांनी बऱ्याच ठिकाणी असहकारावर भाषणे केली असता त्यातील तीन-चार भाषणांच्या आधारे ती राजद्रोहात्मक आहेत असा आरोप त्यांच्यावर ठेवण्यात आला. तसेच भिकमसिंह यांच्यावर क्रिमिनल प्रो. कोड १०८ प्रमाणे खटला भरण्यात आला. यावेळी या.मा.काळे यांनी देशभक्त भिकमसिंह यांची बाजू घेवून सरकारविरुद्ध खटला सुरु केला. त्यांनी दादाभाई नौरोजी, गोखले, इ. च्या भाषणातील व भिकमसिंहच्या भाषणातील अपेक्षित उताऱ्यांसह भाग सारखे आहेत हे युक्तिवादात न्यायाधिकांसमोर मांडले. तेव्हा न्यायाधिकांस फ्रस्ट क्लास मॅजिस्ट्रेट कडाळे यांनी देशभक्त भिकमसिंह क्षत्रिय या राजकीय कैद्याची मुक्तता केली.

संपूर्ण वन्हाडात सरकारने शेतकऱ्यांपासून महार बलुते नावाचा कर वसूल करणे सुरु केले. ह्या कराने शेतकऱ्यांवर होत असलेल्या अन्यायाविरुद्ध या.मा. काळे यांनी 'एका शेतकऱ्याने ' या नावाखाली महाराष्ट्र व हितवाद या प्रांतिक वर्तमान पत्रात बलुत्यांवर होत अलेक लेख प्रसिद्ध करून, शेतकऱ्यांवर होत असलेल्या अन्यायास तोंड फोडले. या लेखांमुळे शेतकऱ्यांमध्ये जागृती होवून सरकारविरुद्ध संघर्ष करण्यास सिद्ध झाले.

असहकार चळवळ मागे घेतल्यानंतर १९२३ मध्ये असेंब्ली व कायदे कौन्सिलच्या निवडणूका घोषित झाल्या. यावेळी या निवडणूकांमध्ये स्वराज्य पक्ष मोठ्या ताकदीने उतरला. या.मा.काळे, रा.अ. कानिटकर, हे सामाजिक, आर्थिक, शेतकऱ्यांचे प्रश्न घेवून चळवळ करीत होते. त्यांनी परिषद-सभामधून बुलडाणा जिल्हयात मोठी जागृती घडवून आणली. या चळवळीचा कोणताही उद्देश असला तरी अंतिम लक्ष 'कौन्सिल असेंब्लीच्या किंवा स्थानिक स्वराज्य संस्थांच्या निवडणूकी' हेच होते. या. मा. काळे हे यावेळी वन्हाड स्वराज्य पक्षाचे प्रांतिक कौन्सिलसाठी पश्चिम वन्हाडातून जमिनदारांतर्फे उमेद्वार होते. या मतदार संघात स्वराज्य पक्ष व



ब्राम्हणेत्तर पक्ष यांच्यात प्रतिष्ठेची व चुरशीची निवडणूक झाली. त्यात दास-नेहरु स्वराज्य पक्षाचे उमेदवार यादव माधव काळे यांनी ब्राम्हणेत्तर पक्षाचे उमेदवार रा.ब.केशवराव जानराव देशमुख यांचा दणदणीत पराभव केला. याकाळात वऱ्हाडात स्वराज्य पक्षाच्या सभासदांनी महत्त्वपूर्ण कामगिरी बजावली. सरकारला या सभासदांनी कोंडीत पकडून बेचैन करून सोडले. कौन्सिलची पूर्णपणे कायदेशीर कुचबना केली. स्वराज्य पक्षाने उत्पन्न केलेल्या परिस्थितीमुळे दि. ७ ऑगस्ट १९२४ रोजी सरकारला सुधारणा चौकशी कमेटी म्हणजे 'मुडीमन कमेटी' नेमण्यास भाग पाडले व द्विदल राज्यपद्धतीचा सरकारला पुर्नविचार करावा लागला. या.मा.काळे यांनी सभागृहात वऱ्हाडाची संबंधित अभ्यासपूर्ण प्रश्न विचारले. वऱ्हाडाची आर्थिक परिस्थिती अतिशय बिकट होती. परंतु वऱ्हाडाचे उत्पन्न अधिक असूनही त्या उत्पन्नाचा फायदा मध्यप्रांतालाच जास्त मिळत होता. त्यासाठी या.मा.काळे यांनी हा प्रश्न उपस्थित करून सर्वांना मान्य होईल असा मसुदा तयार करण्यास सरकारला सहाय्य केले. हा मसुदा 'सिम फॉर्म्युला' या नावाने त्याकाळी प्रसिद्ध झाला. यावेळी या.मा. काळे हे वऱ्हाड-मध्यप्रांत स्वराज्य पक्षाचे जनरल सेक्रेटरी होते.

दासबंधूच्या मृत्यूनंतर स्वराज्य पक्षात तात्वीक मतभेदाला सुरुवात झाली. लवकरच स्वराज्य पक्षात फुट पडली. १९२६ च्या काळात वऱ्हाडातून जवळजवळ स्वराज्य पक्ष नामपेश होण्याच स्थितीत असतांना या. मा. काळे यांनी मात्र राष्ट्रीय स्तरावरील नेते पं. नेहरु यांनी सांगितल्याप्रमाणे कौन्सिल किंवा पक्षाचा राजीनामा दिला नव्हता. त्यामुळे स्वराज्य पक्षाचे दप्तर या.मा. काळे यांच्याकडे सोपविण्यात आले. देशाला स्वातंत्र्य मिळविण्याच्या मार्गामध्ये कितीही मतभेद असले तरी देखिल या.मा. काळे यांनी राष्ट्रीय काँग्रेसची साथ कधीही सोडली नाही. ते ऑल इंडीया कमेटीचे सभासद सुद्धा होते.

१९२३ मध्ये सी.आर. दास व मोतीलाल नेहरु या राष्ट्रीय स्तरावरील नेत्यांनी कौन्सिल प्रवेशासाठी 'स्वराज्य पक्ष' निर्माण केला तेव्हा वऱ्हाडातील नेत्यांनी स्वराज्य पक्षाला मनापासून पाठींबा व्यक्त केला. स्वराज्य पक्ष स्थापन होण्यापूर्वी जी कायदेभंग चौकशी कमीटी नेमण्यात आली त्या कमीटीमार्फत काँग्रेसजणांच्या साक्षी

धेण्यात आल्या. त्यामध्ये पहील्या साक्षीत म्हणजे कार्यक्रमात फरक पाहीजे म्हणणाऱ्यांमध्ये रा.अ. कानिटकर, बामणगांवकर, बापूजी अणे, केळकर, मोहरील, खापर्डे, भागवत, काणे, ही मंडळी प्रमुख्याने होती.

असहकारीतेच्या कार्यक्रमाला ओस पडताच वऱ्हाडात कौन्सिलवादी गट अधिक प्रभावी झाला. वऱ्हाडात 'स्वराज्य पक्ष' स्थापनेमागे या. मा.काळे, बापूजी अणे यांचा मोठा हातभार होता. कौन्सिल प्रवेशाची बंदी उठताच, असेव्ही व कौन्सिलच्या निवडणुकांची तयारी वऱ्हाड स्वराज्य पक्षाने सुरू केली. ठिकठिकाणी प्रचार सभा-व्याख्यांद्वारे जनजागृती करण्यात आली. रा.अं.कानिटकर हे सामाजिक, आर्थिक व शेतकऱ्यांचे प्रश्न घेवून यावेळी चळवळ-प्रचार करीत होते. याद्वारे जनतेला आपल्या अधिकारांची जाणीव करून देत होते. प्रांतिक कौन्सिलसाठी परिचय वऱ्हाडातून रा.अं. कानिटकर यांची उमेद्वारी निश्चित करण्यात आली. मध्यप्रांत- वऱ्हाड प्रांतिक कौन्सिलमध्ये ७० पैकी ४५ सभासद वऱ्हाड स्वराज्य पक्षाने जिंकल्या.

इतिहास संशोधन आणि लेखन

इतिहास संशोधक यादव माधव काळे उर्फ अण्णासाहेब काळे यांनी लोणार वर्णन-१९०४, गोंड राजांचा इतिहास, वऱ्हाडचा इतिहास (1924), नागपुर प्रांताचा इतिहास, नागपूरकर भोसल्यांचा इतिहास (1934), वाकाटकांचा इतिहास (अप्रकाशित ग्रंथ), गोंड राजाचा इतिहास, रघुजी भोसले चरित्र, शिवमहिम्म स्त्रोत्रा, बेरार लॅंड रेव्हिन्न कोड, राजे उदेराम, इत्यादी विविध ऐतिहासिक ग्रंथांची निर्माती केली. आणि इतिहास संशोधकांना संशोधनासाठी मोठे दालन निर्माण केले. त्यांच्या या ऐतिहासिक ग्रंथांचा आधार घेवून अनेकांनी नविन स्थानिक इतिहास उजेडात आणण्याचा प्रयत्न केला आणि करीत आहे. या ऐतिहासिक ग्रंथांबरोबरच या. मा.काळे यांनी नागपूरकर भोसल्यांची काशीराव राजेश्वर गुप्ते लिखित काव्येतिहास संग्रहात प्रसिध्द झालेली बखर, जगन्नाथाचे शशी सेना, काव्य हया ग्रंथात्र स्वतंत्रपणे संपादन केलेले आहे. त्याचप्रमाणे ऐतिहासिक पत्रव्यवहार, पत्रे, व यादी इत्यादी ग्रंथांच्या संपादनात या. मा.काळे यांनी प्रसिध्द इतिहासकार सरदेसाई व वांकसकर 'यांना सहाय्य केलेले आहे. इतिहास संशोधक मंडळ पुणे, मध्यप्रांत संशोध



न मंडळ सी.पी.अॅड बेरर रिसर्च सोसायटी नागपूर, शास्त्रधर्म यवतमाळ, भारतिय ऐतिहासिक कमिशन इत्यादी विविष नामवंत संस्थांचे तें पदाधिकारी तसेच सदस्य सुध्दा होतें.

वन्हाडचा इतिहास हा मौल्यवान ग्रंथात वन्हाडच्या प्राचीन, मध्ययुगीन आणि अर्वाचीन इतिहासाची माहिती आहे. त्यांनी पहिल्या भागात वन्हाडचे स्वाभाविक विभाग व एकंदरीत देशवर्णन केलेले आढळते. त्यात नद्या, पर्वत हवापाणी, पिके, क्षेत्रफळ, व लोकसंख्या निरनिराळ्या काळचे लोकवस्तीचे आकडे, खनिज पदार्थ उद्योगधंदे, यापार, कर पध्दत, राज्यव्यवस्था उत्पन्न खर्च देण्यात आला आहे. दुसऱ्या भागात पौराणिक काळाचा इतिहास आहे तर तिसऱ्या भागात मध्ययुगीन माहिती देण्यात आलेले आहे. वन्हाडचा इतिहास हा ग्रंथ लिहिल्यामुळे या.मा. काळे त्यांची एवढी प्रसिध्दी झाली की ते १९२४ मध्ये विदर्भ साहित्य संघ अधिवेशनाचे अध्यक्ष झाले. कलकत्ता, बडोदा, म्हैसूर, इंदोर, हैदराबाद येथील अधिवेशनात ते उपस्थित होते.

या.मा.काळे यांचा नागपूर प्रांताचा इतिहास हा ग्रंथ सुध्दा मौलीक आहे त्यांची अनेक इतिहासकार जाणकारांनी मुक्त कंठाने स्तुती केलेली दिसून येते यातच त्यांचे अनन्यसाधारण महत्व दिसते. मराठ्यांच्या इतिहासातील हा एक महत्वपूर्ण सखोल असा ग्रंथ या. मा. काळे यांनी वाचकांना उपलब्ध करून दिला असे गो.स.सरदेसाई म्हणतात.

जदुनाथ सरकार म्हणतात, "रा. यादवराव काळे हयांचा नागपूरचा इतिहास म्हणजे मध्यप्रांत व वन्हाडच्या ऐतिहासिक व सांस्कृतिक आयुष्याच्या माहितीचा एक बहुकोश आहे. ग्रंथकाराने सर्व आयुष्यभर अनेक ऐतिहासिक स्थळे स्वता पाहून व स्वता चौकशी करून केलेलेल्या संशोधनाचा हा इतिहास 'एक निर्दशक आहे. रा.गोत्र स.सरदेसाई हयांनी छापलेल्या पेशावे दफ्ताराच्या खंडातील नवीन माहितीचा उपयोग या ग्रंथात केऱ्यामुळे हा ग्रंथ पूर्ण झाला आहे व त्या योगाने हल्ली प्रचलित असलेल्या पुष्कळ चुका दुरूस्त झाल्या आहेत.

अशा प्रकारे यादव माघव काळे यांनी विदर्भाबरोबरच महाराष्ट्र व भारतात देखील आपली कर्तबदारी सिद्ध केली. दिनांक ११ मार्च १९४३ रोजी त्यांची प्राणज्योत मालविली. त्यांचे सामाजिक व

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विद्यावार्ता: Interdisciplinary Multilingual Refereed Journal | Impact Factor 7.940 (IIJIF)

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Study of Physico-Chemical Parameter of Soil Analysis

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Abstract: The soil is a mixture of solid, water and gases and also a mixture of minerals, organic matter, gases, liquid and other macro or microorganisms and it performs four important functions. The basic of the status of soil we decide requirement of fertilizer to increase the fertility of the soil. This work examines the principal physical and chemical attributes that can serve as indicators of a change in soil quality under particular agro-climatic condition. You will find that different soil can vary greatly in their composition. Proposed indicator including soil depth to a root restricting layer, water holding capacity, organic matter, N, P, K, Cl, electrical conductivity, moisture content. We also confirmed the justification for selecting these key attributes, their measurement, critical limit for monitoring change in solid productivity and soil quality and crop growth in that soil.

Keywords: Physico-Chemical Parameter

I. INTRODUCTION

Soil is a complex collection of Organic and Inorganic matter. Soil is called the *layer of the Earth* and involve lithosphere, hydrosphere, atmosphere & biosphere. *pedolith*, used to prefer to the soil, content translates *ground stone*. it consists of a solid phase of minerals, organic matter, and porous phase that holds the soil moisture with water. respectively, soils are often treated as system of solids, liquids, and gases.

Soils are consist of mineral and organic particles of various sizes. The particles are associated in a matrix with results in about 50% porous; it is filling up with water and air. This will prepare a three-phase system of solids, liquids, and gases; all uses of soils are greatly affected by physical properties.

Plants need certain *nutrient elements* to complete their life cycle. No element can substitute for the same. 16 elements are essential for the growth of most vascular plants. Carbon, hydrogen, and oxygen are combined in photosynthesis reactions and are obtained from air and water. These three elements compose 90 % of the dry matter of plants. The remaining is obtained largely from the soil and is referred to as the *macronutrients*.

II. FACTORS AND PROCESSES

- This is accomplished by disintegration & decomposition
- It is related with the action of Soil Factors

2.1 Factors

The soils develop as a result of the action of soil forming factors

$$S = f(P, Cl, O, R, P, T)$$

Further, Jenny (1941) formulated the following equation

Where, Cl – environmental climate

O – Organisms and vegetation (biosphere)

R – Relief or topography


P – Parent material

T – Time

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DOI: 10.48175/IJARSCT-2571

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III. METHODOLOGY

3.1 Area of Study

Kelwad village is situated on the Chikhali Buldana road. There is more forestry area around the village. It is about 35 k.m. away from Buldana in Chikhli Tehsil dist. Buldana. Buldana is one of the five Districts of Amravati division of Vidharbh region of Maharashtra near satpuda mount.

Mostly Agriculture crop is found in kelwad village is as follows Jawar, chili, wheat, soybean but now a day's mostly soyabin crops , out of these cotton is one of the most important crop in Kelwad village

Various type of soil is present in Dasala

1. Lime soil
2. Black cotton soil
3. Red soil.....etc.

The collected soil samples analysis kit platform available in Laboratory of U.G. Department of Chemistry, Jijamata Mahavidyalaya, Buldana using standard methods available in the literature.

Ten soil samples are proposed to collect from the farms of following farmers at Kelwad village.

Sr. No.	Name of Farmer	Source
1	Prakash Pundlik Lahane	Farm
2	Jayant Anurag Jadhav	Farm
3	Rajaram Gajanan Gawai	Farm
4	Devidas Totaram Jatol	Farm
5	Sanjay Vitthal Patil	Farm
6	Sk. Ganim sk. Alim	Farm
7	Sunil Ganesh Gadekar	Farm
8	Haridas Punjaji Sole	Farm
9	Vilasrao Sheshrao Bahekar	Farm
10	Damodar Arjun Patil	Farm

Procedure and Calculation of following pH

Procedure:

Extraction

1. Add 20 ml distilled water to 8 g air-dried sample in a beaker Take the suspension temperature.
2. Stir at regular intervals for 20-30 minutes.
3. Use pH meter electrode with distilled water.
4. Open the switch, wait for 5 minutes then adjust temperature to room temperature.

Measurement

1. Wash the electrode with distilled water.
2. Record the pH value of the soil suspension.

3.2 Electrical Conductivity (EC)

This is commonly used for measuring the electrical resistance in the solution this will indicates the total concentration of ionized constituents in solutions. Which is closely related to the sum of the cations and anions in the suspension? It used for indicate salinity in soil. Electric conductivity can be expressed as cm in 11:215 soil/water extract.

3.3 Reagents

KCl solution 0.01N: Dissolve 0.7456 g of dry KCl in distilled water and make to 1 L at 25°C. This is a std. reference solution, which at 25°C has an E.C. of 141118×10^{-6} (0.0014118) mhos/cm or 11.4118 m mhos/cm.

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DOI: 10.48175/IJAR SCT-2371

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Where: V = Volume 0.01 N silver nitrate and titrate.
B = Blank titration volume (ml),
R = Ratio between total volume of the extract and extract volume used for titration, N = Normality of AgNO₃ solution,
Wt = Weight of air-dry soil (g)

3.4 Water Holding Capacity

Apparatus and Reagents

Whatmann's filter paper, soil analysis kit, cylinder, measuring beaker, funnel conical flask, Weight balance, Distil water, etc.

Procedure

1. Weight accurately 20 gm of soil sample on the balance
2. Then transfer this soil on the Whatman's filter paper and kept this soil in funnel then on the measuring cylinder
3. Then accurately pour 40 ml of water into the soil sample (which kept on filter paper in funnel)
4. Keep this experiment stay for one night
5. Then observe how much of water is come down from soil sample in measuring cylinder
6. Then accurately weight the wet soil with filter paper
7. Then subtract weight of filter paper from wet soil
8. Then calculate the water holding capacity by the using below formula

WHC = [weight of wet soil – weight of taken soil]

3.5 Moisture Content

Principle:

Hygroscopic water of air-dry soil is determined by heating in an oven at 105°C.

Apparatus:

1. Electric oven with thermostat.
2. Desiccators with siccative.

Procedure:

1. Weigh 5.00 g of air-dry soil < 2 mm into a previously dried (at 105°C) and weighed weighing- dish with lid (a labeled aluminum dish).
2. Dry in an oven at 105°C with unfitted lid over-night.
3. Remove from oven, fit lid, cool in a desiccators for at least 30 minutes and reweigh. All weighing should be recorded to 3 decimal places.

Calculation:

$$\% \text{ moisture} = \frac{\text{wetsoil}(g) - \text{Drysoil}(g)}{\text{drysoil}} \times 100$$

3.6 Soil Organic Matter: Walkley-Black Method

Equipment:

1. 500- ml Erlenmeyer flasks.
2. 10 ml pipette.
3. 10 and 20 ml dispensers.
4. 50 ml burette.
5. Analytical balance.
6. Magnetic stirrer.



Reagents:

1. H₃PO₄ 85%
2. H₂SO₄ concentrated (96%)
3. NaF, solid
4. Standard 1.00 N K₂Cr₂O₇
5. 0.5 N Fe⁺⁺ solution: Dissolve 1.961g of Fe(NH₄)₂(SO₄)₂ · 6 H₂O in 800 ml of water containing 20 ml of concentrated H₂SO₄ and dilute to liter. The Fe⁺⁺ in this solution oxidizes slowly on exposure to air so it must be standardized against the dichromate daily.
6. Ferroin indicator: Dissolve 3.71 g of O-phenanthroline and 1.74 g of FeSO₄ · 7H₂O in 250 ml of water.

Procedure:

1. Weigh out 0.10 to 2.00 dried soil (< 60mesh) and transfer to a 500 ml Erlenmeyer flask. The sample should contain 10 to 25 mg of organic C (17 to 43 mg organic matter). For a 1 g sample, this would be 1.2 to 4.3% organic matter. Use up to 2.0 g of sample for light colored soils and 0.1 g for organic soils.
2. Add 10 ml of 1 N K₂Cr₂O₇ by means of a pipette.
3. Add 200 ml of concentrated H₂SO₄ by means of dispenser and swirl gently to mix. Avoid excessive swirling that would result in organic particles adhering to the sides of the flask out of the solution.
4. Allow to stand 30 minutes. The flasks should be placed on an asbestos sheet during this time to avoid rapid loss of heat.
5. Dilute the suspension with about 200 ml of water to provide a clearer suspension for viewing the endpoint.
6. Add 10 ml of 85% H₃PO₄, using a suitable dispenser, and 0.2 g of NaF, using the "calibrated spatula" technique. The H₃PO₄ and NaF are added to complex Fe³⁺, which would interfere with the titration endpoint.
7. Add 10 drops of ferroin indicator. The indicator should be added just prior to titration to avoid deactivation of adsorption onto clay surfaces.
8. Titrate with 0.5 N Fe⁺⁺ to a burgundy endpoint. The color of the solution at the beginning is yellow-orange to dark green, depending on the amount of the unreacted Cr⁺⁺ remaining, which shifts to a turbid gray before the endpoint and then changes sharply to a wine red at the endpoint. Use of a magnetic stirrer with an incandescent light makes the endpoint easier to see in the turbid system. (Fluorescent lighting gives a different endpoint color). If less than 5 ml of Fe⁺⁺ solution was required to backtitrate the excess Cr⁺⁺, there was insufficient Cr⁺⁺ present, and the analysis should be repeated either by using a smaller sample size or doubling the amount of K₂Cr₂O₇ and H₂SO₄. Alternatively use a Pt electrode to determine the endpoint after step 5 above. This will eliminate uncertainty in determining the endpoint by color change.
9. Run a reagent blank following the above procedure without soil. The reagent blank is used to standardize the Fe⁺⁺ solution daily.

10. Calculate % C and % organic matter:

- a. % easily oxidizable organic C

$$C = \frac{(B-S) \times n \times Fe^{++}}{gm\ of\ soil} \times \frac{12}{4000} \times 100$$



IV. RESULT

The physical, chemical properties and all parameters of the collected soil sample from the various farms are discussed below: (F = soil sample in farm)

Farm	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10
P.m. ↓										
water Holding Capacity	8.9	0.6	10.15	2.11	10	10.1	5.5	11.2	10.5	9.1
pH	7.2 (26 ⁰ C)	6.76 (24 ⁰ C)	6.90 (25 ⁰ C)	7.2 (26 ⁰ C)	6.73 (23 ⁰ C)	7.3 (22 ⁰ C)	6.82 (26 ⁰ C)	6.92 (25 ⁰ C)	6.43 (24 ⁰ C)	7.23 (25 ⁰ C)
Electrical conductivity ms ⁻¹	0.517	0.419	0.519	0.215	0.275	0.529	0.129	0.320	0.512	0.215
Moisture Contain %	4.3	3.5	2.09	1.0	2.05	4.2	4.3	3.21	4.2	4.5
Organic Carbon %	2.3	1.8	1.6	1.40	1.50	1.33	2.28	1.70	2.50	2.40
Soil texture %										
1. Sand	16	16	20	20	25	20	15	10	9	16
2. Silt	32	36	30	30	30	30	30	40	43	37
3. Clay	52	52	50	50	55	50	45	50	52	53

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Impact of COVID-19 Pandemic on Indian Economy

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Abstract-

Knowingly or unknowingly one virus (Corona) which is now known as COVID-19 have spread in worldwide and showed its dangerous consequences on the universal activity. All countries have suffered and yet suffering with a very pathetic situation founds from the beginning of year 2020, known as cause covid-19 pandemic. All social and economic activities have been inactive during these pandemic period, many countries have turn on lockdown to control the spread of corona virus in masses. It is resulted on the effect on market production, sales and marketing, transportation, employment, education, medical services, etc. Naturally, it leads to increase in unemployment, block the supply chain of production, affected the purchasing power and demand of consumers, and decreased the income of industrial sector and the government too. India is also suffering with the covid-19 pandemic, all economic activities are badly affected and shown reverse growth as in the first quarter of year 2020 growth went down by 3.1%1. Including India all nations are fighting against Covid-19 pandemic. In today's date, its impact and nature differs from country to country. In some developed countries like- America (USA), Italy, France, UK, Germany, etc. the virus have already caused a lot of distress. Indian economy is also suffering from the critical condition all the sectors of the economy have wrecked, production, demand, income, employment, transportation, construction, education, medical every aspect of the economy is badly affected and no more signs of out coming or reviving are perceived. Peoples are suffering to maintain their daily needs; increasing numbers is a big challenge for the medical sector to how to provide these facilities to these increasing patients of covid-19 disease. Today these numbers are over 53 lacks and the human casualties have also increasing.. This is the first time in the history of human survival that the whole world is facing such a crisis.

Keywords- COVID-19, Indian Economy, Unemployment, Industrial Sector, Service Sector, Banking Sector etc.

Introduction:

Covid-19 pandemic have affected all the countries of the world; business, production, transportation, education, medical services, national and international trade, etc. every sector of the economy have suffering due to the ongoing crises of Covid-19 pandemic. To stop the spread of corona virus it is necessary to stop all the activities; locked down; where the people come in others contact or gather for their work they got infected with the person who is infected with corona virus. Only one precaution will save many people's life if they quarantine themselves for some days. Keeping the same precautionary measure in mind government have lockdown all the socio economical activity from last six months. Naturally, all sectors of the Indian economy were almost closed. All the business and other activities were shutdown. Covid-19 (Corona Virus) being an infectious virus it is considered as a global pandemic by WHO. The only way to prevent getting infected by the virus is maintaining social distance. The vaccine for the virus is yet under the laboratory research. As per the guidelines of WHO every country is following the respective measures of social distancing and therefore, every nation has locked down (social curfew) their all social and economical activities.





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clear. Similarly, Domestic rating agency CRISIL cut its projections for India's economic growth rate to 1.8 per cent, from 3.5 per cent it had earlier predicted for 2020-21. Moody's Investors Service, also, slashed India growth forecast for calendar year 2020 to 0.2 per cent, from 2.5 per cent projected in March. For 2021, the rating agency expects India's growth to rebound to 6.2 per cent.

• **Impact of Covid-19 on Tourism, Aviation and Retail:**

The tourism industry is the worst affected due to the COVID crisis, internationally. The World Tourism Organization estimations depict a fall of 20-30 per cent in international tourist arrivals. These figures too are based on present circumstances and are likely to increase or decrease in future. Millions of people associated with industry are likely to lose their jobs. In India, the travel and tourism industry is flourishing and is contributing sizably to the economy.

The FICCI-Yes Bank report titled 'India Inbound Tourism: Unlocking the Opportunities' described India as a tourism powerhouse and the largest market in South Asia. Tourism in India accounted for 9.2 per cent of GDP and had generated US\$247.3 billion in 2018, with the creation of 26.7 million jobs. Currently, it is the 8th largest country in terms of contribution to GDP. According to the report, by 2029, the sector is expected to provide employment to nearly 53 million people. Foreign Tourist Arrivals (FTAs) crossed 10 million in 2017. However, the corona virus pandemic has restricted international mobility and the revenues generated by this sector will take a major toll on the GDP growth rate. It may bring a downfall of 0.45 per cent in the growth rate of GDP.

The aviation sector in India currently contributes US\$72 billion to India's GDP. Foreign tourist arrival has been down in the first quarter. The lockdown will have a significant impact on arrivals in the second quarter. If we estimate a conservative 25 per cent decline in the contribution of the aviation sector, it will amount to 18 billion. Railways contributed US\$27.13 billion in 2019 to GDP. A 21-day lockdown period will bring down the revenue by US\$1.56 billion. The Indian retail industry was worth US\$790 billion in FY 2019. It accounts for over 10 per cent of the country's GDP and around 8 per cent of employment. In the past few years, online retail has seen a very rapid growth and the market projections had indicated a 30 per cent growth in online retail in 2020. A month-long shutdown for retail will affect the Quarter 2 revenues. In the retail sector, the suppressed demand has a tendency to revive very fast and this will enable the sector to recover the losses once the lockdown is lifted. Online retail was operational in some parts of the country during the lockdown period and this will help in offsetting some of the losses for the industry.

• **Impact of Covid-19 on Imports/ Exports:**

India imports roughly 55 % of electronic goods from China which has reduced to less than 40 % in the pandemic era. On the other hand, Indian exports in terms of raw materials like cotton, mineral fuels, organic chemicals to China stands at the third place. The imbalance in the export and import will put burden on the trade deficit between both the countries

• **Impact of Covid-19 on Share markets :**

The downfall is seen in the Indian stock markets, like BSE Sensex points dropped to 29,894 on 8th April from a higher value at 42,273 on 20thJan, 2020. The Sensex and mid-cap index fell by 22 and 26.5 respectively in FY20. There is also lowering of P/E (Price to earnings) ratio to 18 from the historical average of 20-24. The stock market crash is an indicator of looming Great Depression crisis that unfolded in 2008 and COVID-19 is acting as a black swan event for the same

• **Impact of Covid-19 on Oil Market :**

The Indian Oil & Gas industry is quite significant in the global context – it is the third-largest energy consumer only behind USA and China and contributes to 5.2% of the global oil demand. The complete lockdown across the country slowed down the demand of transport fuels (accounting for 2/3rd demand in oil & gas sector) as auto & industrial manufacturing declined and goods & passenger





The present paper tries to focus on the impact of Covid-19 on Indian economy and try to find out and suggest some remedial measures to overcome on it.

Meaning :

Corona viruses are a large family of viruses which may cause illness from animals to humans. In humans, several corona viruses are known to cause respiratory infections ranging from the common cold to more severe diseases such as Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS). The most recently discovered corona virus causes corona virus disease COVID-19. Covid-19, this disease name is derived from the word corona and 19 is the respective year when it found.

Objectives of the Study :

1. To study the impact of Covid-19 pandemic on the various sectors of Indian economy.
2. To find out the impact of the Covid-19 as to understand damage of the economy with its severity.
3. If the impact and its effects are properly identified it will be easy to provide relief package to that sector of the economy.
4. To study the national and international situation and measures that implemented to overcome on this universal pandemic will help us to take prompt and necessary action and measures to overcome on it.

Hypotheses:

It is a universal pandemic. Near about every country is facing the same situation. therefore, the strong will power and proper remedial action and with the support and voluntarily participation in this pandemic with keeping social distance and keeping ourselves away from common gathering will lead us to overcome on this pandemic. Research Methodology- The character of the research study is descriptive research. To fulfill the requirement of this topic of research study researcher has selected authentic information to study the problem. The secondary data or authentic information is collected through government published reports, journals and internet. Present study will help to understand the present situation and the sectors which get more affected due to Covid-19, as well as discussion on the present topic will definitely help to find some remedial measure to overcome on this Covid-19 pandemic situation.

“Impact of Covid-19 Pandemic on Indian Economy”

Covid-19 is a very horrible situation at worldwide where not only developing economics but developed economy also faced setback to their economies. America, England, Russia, Australia, Middle East, Asia, etc. every country have suffered in covid-19 pandemic and yet suffering. India a developing and a world's second largest populated country, with more than 125 crore population, and in this pandemic situation when the Corona virus is highly transmissible and a number of cases founds spreading fast across the nation-wide is a big challenge. Medical facilities required for these patients as the fast spread is taken place in Indian economy day by day and now we stand on second position having a large number of cases, it is very difficult for the medical sector to overcome on it. We are facing a lack of beds, medicines, oxygen, doctors and nurses, ambulances, isolation centers, etc. to tackle the situation.

• **Impact of Covid-19 on GDP Growth :**

The International Monetary Fund (IMF) slashed India's growth estimate for FY21 to 1.9% from 5.8% estimated in January, warning that the “worst recession since the Great Depression” will dwarf the economic damage caused by the global financial crisis a decade back. It also said that India and China would be the only two major economies likely to register growth, with all others contracting. The Covid-19 pandemic will shrink world output by 3% in 2020, IMF said in the April update of its World Economic Outlook (WEO), the first after the magnitude of the outbreak became





COVID 19 due to brief price wars between the service providers. Most essential services and sectors have continued to run during the pandemic thanks to the implementation of the 'work from home' due to restrictions. With over 1 billion connections as of 2019, the telecom sector contributes about 6.5 per cent of GDP and employs almost 4 million people. Increased broadband usage had a direct impact and resulted in pressure on the network. Demand has been increased by about 10%. However, the Telco's are bracing for a sharp drop in adding new subscribers. As a policy recommendation, the government can aid the sector by relaxing the regulatory compliances and provide moratorium for spectrum dues, which can be used for network expansions by the companies.

- **Impact of Covid-19 on Pharmaceuticals**

India imports about 70 per cent active pharmaceutical ingredients (APIs) from China. These APIs are very crucial to combat the pandemic as the country's dependence on common medications will surge. Also, Indian pharma industry which is the third largest in the world contributing about 60% for common vaccines and the generic drugs, the supply to the other countries will take a hit.

- **Impact of Covid-19 on Micro, small and medium enterprises (MSMEs) :**

The micro, small and medium enterprises as a whole form a major chunk of manufacturing in India and play an important role in providing large scale employment and also in the country's exports. Recent annual reports on MSMEs indicate that the sector contributes around 30% of India's GDP, and based on conservative estimates, employs around 50% of industrial workers. Over 97% of MSMEs can be classified as micro firms (with an investment in plant and machinery less than Rs 25 lakh), and 94% are unregistered with the government. Many of the micro enterprises are small, household-run businesses. Although all businesses have been affected by the pandemic, the MSME sector would be badly hit by reduced cash flows caused by the nationwide lockdown. Their supply chain would be disrupted, and they would be affected by the exodus of migrant workers, restrictions in the availability of raw materials, by the disruption to exports and imports and also by the widespread travel bans, closure of malls, hotels, theatres and educational institutions etc. This, in turn, would massively hamper the MSME businesses. As a consequence, hundreds of thousands of people who work for these small businesses may end up with job and salary losses.

- **Impact of Covid-19 on Employment :**

The data from the Consumer Pyramid household level survey of the Centre for the Monitoring of Indian Economy (CMIE) shows that the unemployment rate in urban areas increased sharply to 30% in the week ending March 29, about 3.5 times the rate of 8.7% for the week ending March 22. For rural areas, the corresponding figures were 21% and 8.3%. The overall unemployment rate increased from 8.4% to 23.8%. The data for the week ending April 5 estimates the rate at 30.9% for urban areas, 20.2% for rural areas and 23.4% at the all-India level.

- **Covid-19 and Impact on Education:**

On 16th March, 2020, the union government declared a countrywide lock-down of schools and colleges. CBSE and JEE, NEET, MHT-CET and other examinations were postponed. Maharashtra Government cancelled examinations for class 1 to 8 standard and also college examinations excluding final year examination and promoted the students to the next classes. The way technology is being used in education, a new discipline, called education technology has emerged. SWAYAM, an acronym for study webs of Active Learning for young Aspiring Minds, is an online digital platform which hosts several courses offered by the teachers of universities, colleges and schools free of cost to the students living in any part of the country. During COVID-19 pandemic Technology driven online education system like SWAYAMPBHA DTH Channels, DIKSHA platform, etc. play an important role in Indian education system. The Government's push for "One Nation, One Digital Platform for learning" has resulted into the creation of Digital Infrastructure for Knowledge sharing.





movement (both bulk & personal) fell. Though the crude prices dipped in this period, the government increased the excise and special excise duty to make up for the revenue loss, additionally, road cess was raised too. As a policy recommendation, the government may think of passing on the benefits of decreased crude prices to end consumers at retail outlets to stimulate demand.

A historic drop in demand for oil has dropped the crude oil prices to an 18 year low of US\$22 per barrel, in March from US\$65 per barrel in January. Some estimates have pegged a saving of US\$7–8 billion for India for every US\$5 a barrel fall in crude oil prices. A fall in crude oil prices may cut India's current account deficit, which was 1.55 of GDP in 2019–2020 . But the capital outflows from India may exceed the potential saving in the current account deficit. INR to USD average exchange rate has been 70.4 per US dollar, but it is already quoting near the psychological barrier of 75 per US dollar. If capital outflows from India continue, rupee (INR) may depreciate further in the coming days.

- **Impact of Covid-19 on Food and Agriculture:**

The food and agriculture sector contributes the highest in GDP i.e. 16.5% and 43% to the employment sector. The major portion of the food processing sector deals with dairy (29%), edible oil (32%), and cereals (10%). India also stands number one in dairy and spices products at a global scenario (export).

The supply of the food and Agri - the product will be affected in the coming seasons due to low sowing of the upcoming seasonal crops which will affect the mandi operations as said by the Ministry of Agriculture. The companies which deal with Agro-chemical depend on export for finished goods and import of raw materials. The food retail with the Central government and State governments allowing free movement of fruits and vegetables the Bricks and Mortar grocery retail chains are operating normally but with the shortage of staff is impacting operation.

It is expected that with prolonged lockdown the demand for the food supplies will increase. The online food grocery, on the other hand, suffers a huge loss due to the restriction of delivery vehicles. With the shortage of labor, the food processing units are facing a hunch in normal function but the government is trying to ease out the situation until that the factories have to adjust to working with low labor count. A major destination in the grapple of covid-19 for the next few months the Indian export is impacted due to low consumer demand the export-oriented commodities like seafood, mangoes, grapes are crashing this will impact the future crop availability.

- **Impact of Covid-19 on Fiscal and Monetary Measures :**

Corona virus pandemic demands coordinated fiscal and monetary policy measures to deal with it. The fiscal measures include paying the healthcare bill raised by the pandemic. Providing for masks, gloves, testing kits, personal protection equipment, ventilators, ICU beds, quarantine wards, medicines and other equipment would mean a huge increase in healthcare spending. Public spending on healthcare in India is 1.1 per cent of GDP. It is likely to increase in the current fiscal year. The government has declared a relief package of 1,700 billion, it will be used to make cash transfers to the poor and vulnerable sections of the society. The sectors that are affected the most, that is, MSMEs and the farms, will be supported by another relief package which will be announced soon. Tourism and those sectors which are integrated with global supply chains will require support. Tax revenues will also drop due to recession. Fiscal receipts could drop by at least 2 per cent of GDP. All these fiscal measures will increase fiscal deficit by 1–1.5 per cent, which is currently at 3.2 per cent, as predicted by economists. The crisis emerging from the coronavirus spread will pull down investment and consumption demand. Conventionally, the demand side components of GDP account for 72.1 per cent consumption, out of which government consumption is 19 per cent as depicted

- **Impact of Covid-19 on Telecom:**

There has been a significant amount of changes in the telecom sector of India even before the



INDIA – PAKISTAN RELATIONS SINCE INDEPENDENCE

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Introduction

India and Pakistan emerged in August 1947 as successor states of British India with distinctive identities. India normatively and constitutionally enshrined secularism, albeit with Hindu majoritarianism. Pakistan, in part because of its relative ethno national diversity, opted for an overwhelming Islamic character for nation-building and securitization vis-à-vis a 'Hindu' enemy. These incompatible state ideologies ensured that the India and Pakistan fought a war after independence over the control of Jammu and Kashmir. Moreover, the two states conflicted over the assessment and distribution of the colonial institutional and financial legacy; in particular how the civil and military bureaucracy would be divided and the appropriation of the capital. In 1965, India and Pakistan fought another inconclusive war over Kashmir and a few years later in December 1971 fought a third war that saw India support East Pakistani rebels and partition Pakistan, creating the independent state of Bangladesh. Nevertheless, Pakistan quest for strategic parity with nuclear-capable India continued in the following decades. The Siachen issue (1984), Brassatacka (1987) and Zarb-e-Momin (1989) further confirmed the deteriorated nature of bilateral relationship..

Though then Indian Prime Minister Rajiv Gandhi visited Pakistan in 1989, the two sides failed to normalize their bilateral relations in the 1990s. Driven by their security concerns and fear of the other's intentions, both states fought once more over the border town of Kargil in Kashmir in 1999. The much – hyped Agra Summit in July 2001 provided a window of opportunity to the two countries' leadership to sit and talk together. However, the embedded misgivings and mistrust remained staunchly intact. Currently, India – Pakistan relations are replete with examples of territorial conflict (namely Kashmir and Sir Creek), security challenges (terrorism), energy deficits and resource shortages (water scarcity), strategic uncertainty (arms race) and geopolitical tussle (proxy war in Afghanistan). This rivalry takes place in the backdrop of an overall abysmal state of human development in both states. In this regard, this paper examines India – Pakistan relations since independence.

Roots of Conflict

Since independence, relations between Pakistan and India have been characterized by rivalry and suspicion. Although many issues divide the two countries, the most sensitive one since independence has been the status of Kashmir. At the time of Independence and the departure of the British from South Asia, the princely state of Kashmir, though ruled by a Hindu Maharajah, had a majority Muslim population. At first, the Maharajah hesitated in acceding to either Pakistan or India in 1947, but when tribesmen armed by Pakistan with the



overt support of regular troops began invading occupied Kashmir, the Hindu Maharajah had no option other than to call upon India to repel the invasion and annexed the territory. Following the invasion, the Maharajah offered his allegiance to India. Pakistani troops still continue to occupy the Northern and Western portion of Kashmir referred to as Pakistan Occupied Kashmir (P.O.K.) in India and Azad Kashmir in Pakistan. India and Pakistan agreed with UN resolutions which called for a UN-supervised plebiscite to determine the future of Kashmir. But Pakistan has refused to remove their troops from Pakistan occupied Kashmir and have thereby frustrated carrying out the plebiscite.

Indo- Pakistani War of 1965

Full-scale hostilities erupted in September 1965 when Pakistan attacked India forcing India to attack Lahore in retaliation. Full-scale hostilities erupted in September 1965 when Pakistan attacked India forcing India to attack Lahore in retaliation. Hostilities ceased three weeks later, following mediation efforts by the UN and interested countries at a time Lahore, one of the most important cities in Pakistan was on the brink of falling to the Indian Army. In January 1966, Indian and Pakistani representatives in Tashkent, and agreed to attempt a peaceful settlement of Kashmir and their other differences.

Indo—Pakistani War of 1971

During the Indo-Pakistani war of 1971, the Pakistan Air Force carried out bombing raids on different airfield in India. India was thus drawn into the civil war between the east Pakistanis of Bengal and the Pakistanis of the West, and started helping anti-Government rebels to liberate East Pakistan to form Bangladesh. The war ended in a humiliating defeat for Pakistan in which 90,000 Pakistani soldiers were taken prisoner by India. Large parts of Pakistani territory were also captured by India. Pakistan President Zulfikar Ali Bhutto and Indian Prime Minister Indira Gandhi met in the mountain town of Shimla, India in July 1972 for the Shimla Accords. India magnanimously agreed to return the large swathes of Pakistani territory captured by India and repatriate the 90,000 captured Pakistani prisoners of war. They agreed to a "Line of Control" (ceasefire line) in Kashmir resulting from the December 17, 1971 case-fire, and endorsed the principle of settlement of bilateral disputes through peaceful means. In 1974, Pakistan and India agreed to resume postal and telecommunications linkages, and to enact measures to facilitate travel. Trade and diplomatic relations were restored in 1976 after a hiatus of five years.

Nuclear Arm Race

India's nuclear test in 1974 generated great uncertainty in Pakistan and is generally acknowledged to have been the impetus for Pakistan's nuclear weapons development programme. In 1983, the Pakistani and Indian governments accused each other of aiding separatists in their respective countries, i.e. Sikhs in India's Punjab state and Sindhis in Pakistan's Sindh province. Tensions diminished after Rajiv Gandhi became Prime Minister in November 1984 and after a group of Sikh hijackers were brought to trial by Pakistan in March 1985. In December 1985, President Zia and Prime Minister Rajiv Gandhi pledged not to attack



each other's nuclear facilities. A formal "no attack" agreement was signed in January 1991. In 1996, the Indian and Pakistani governments began high-level talks to resolve the Siachen Glacier border dispute and to improve trade.

Indo- Pakistani Cold War

Bilateral tensions increased in early 1990, when Kashmiri separatists from Pakistan occupied Kashmir backed by the Pakistan's ISI perpetrated violence in Indian Kashmir. Subsequent high-level bilateral meetings relieved the tensions between Pakistan and India, but relations worsened again after terrorist bombings in Bombay, in March 1993. Talks between the Foreign Secretaries of both countries in January 1994 resulted in deadlock.

Improvement in Relations

In the late 1990s, the Indo-Pakistani relationship veered sharply between rapprochement and conflict. After taking office in February 1997, Prime Minister Nawaz Sharif moved to resume an official dialogue with India. A number of meetings at the foreign secretary and Prime Ministerial level took place, with positive atmospherics but little concrete progress. The relationship improved markedly when Indian Prime Minister Atal Bihari Vajpayee traveled to Lahore for a summit with Sharif in February 1999. There was considerable hope that the meeting could lead to a breakthrough. However Pakistan surreptitiously occupied certain border areas forces in Kashmir. By early summer, serious fighting flared up in the Kargil sector. The fighting lasted about a month till the Pakistani forces were driven out of the areas that had been surreptitiously occupied by them.

Relations between India and Pakistan continued to be strained when Pervez Musharraf came to power on October 12, 1999 Pakistani coup d'état. India alleged that Pakistan provided monetary and material support to Kashmiri militants, a charge which Pakistan has always denied even in the face of direct and insurmountable evidence.

War on Terror

In 2001, following the 9/11 attacks, the United States formed an alliance with Pakistan in its War on Terror to use its air bases for operations against Afghanistan and preferring to confer on Pakistan the title of major Non-NATO Ally. However, as Musharraf would later reveal in his book *In the Line of Fire*, Pakistan was coerced in joining the coalition against Taliban in Afghanistan. According to Musharraf, Richard Armitage, then the Deputy Secretary of State, threatened to bomb Pakistan back to Stone Age if it did not join the war on terror.

Musharraf dropped his insistence that no issues could be discussed until the Kashmir issue was fully solved. Bilateral meetings between the two sides resulted in new people-to-people contacts. Air services and cricket matches were restored. Trains started plying between Sindh and Rajasthan. Bans on Indian movies and TV channels were eased in Pakistan.

Transport links across the Line of Control in Kashmir were reopened. More importantly the intelligence services and armies of the two countries started to cooperate in identifying terrorists who threatened attacks. On June 20, 2004, both countries agreed to extend a nuclear



testing ban and to set up a hotline between their foreign secretaries aimed at preventing misunderstandings that might lead to a nuclear war. In 2007 the two countries agreed to start flights between their capitals. Legal trade between the countries reached 2 billion dollars. After the Mumbai terror attacks in 2008, the already fragile have once again worsened.

Relations under Prime Minister Narendra Modi Regime

India – Pakistan relations, under the Narendra Modi government in India and Imran Khan Government in Pakistan, are arguably at the lowest point in their bilateral relationship in this decade. The downward spiral began in 2016, after a series of terrorist incidents targeting India's civilian and military assets and unrest in Kashmir managed to derail political relations between the two countries. Ceasefire violations along the Line of Control (LOC) have since spiked into four digits, increasing every year.

Against the background of heightened political and military tensions, the bilateral relationship has seen a further collapse in 2018 and 2019 as cross-border trade relations have been suspended and official channels of communication between the two governments remain shut. Diplomatic relations deteriorated further in August 2019 after Pakistan's expulsion of the Indian High Commissioner to protest the Indian government's effective abrogation of Jammu and Kashmir's special status. The international community too, shows little appetite for mediation in an India- Pakistan crisis.

In 2018, Indo-Pak relations continued to traverse a tense political and military climate, even as the newly-elected, army –backed PTI government and Prime Minister Imran Khan sought a breakthrough in the form of dialogue and the opening of the Kartarpur route, a long held request of the Indian Sikh community. The Modi government took a more cautious stance, ahead of the approaching election-phase in India, and refrained from making overtures of its own toward Pakistan. The corridor moved ahead on schedule; however, the Indian side refused to resume formal talks with Pakistan. If a breakthrough in India-Pakistan relations was anticipated after the Indian elections in mid-2019, that eventuality was pre-empted by the crisis in February this year.

The Pulwama-Balakot crisis set the tone of the bilateral relationship in more ways than one. The Pulwama attack not only lent further weight to India's accusation of cross-border terrorism emanating from Pakistan's territory but questioned the Imran Khan government's commitment and capacity to keep in check anti-India groups supported by the deep-state in Pakistan. In India, the Bharatiya Janata Party (BJP) cashed in domestically on the crisis with its " anti-Pakistan" and " decisive leadership " rhetoric which, post-poll studies now show, played an influential role in securing the Modi government a second term. The Balakot airstrikes also reiterated Indian willingness to retaliate militarily to major incidents of terrorism designed and launched by groups based in Pakistan.

While a full assessment of the Balakot airstrikes is still pending, the episode underscores the shift in the regional balance of power in South Asia, in India's favor: India, the status-quo larger power challenging the nuclear deterrence of the smaller revisionist power, Pakistan.



What the Modi government seems to have learnt from the February crisis is that, with domestic support for its actions and negligible international intervention, it is now in a position to assert its terms and conditions for the resumption of dialogue with the Government of Pakistan. This way, the present Modi government has been able to retain its slogan of “terror and talks cannot go together.”

Expectations in Future

The present government in India and Pakistan still harbor deep mistrust toward each other. In India, the Imran Khan government is understood to be functioning through the patronage of the country’s powerful army and ISI. The Modi government doubts Khan’s ability to take decisions vis-à-vis India that do not serve the Pakistani Army’s interests. On the other hand, in Pakistan, the Modi government is seen as a Hindu right-wing majoritarian power with hegemonic ambitions in South Asia, a rhetoric that has been prominently at play in Pakistan’s attempts to internationalize events since the abrogation of Article 370.

Given the developments in last two years and the shift in the regional balance of power in South Asia, the Modi government is unlikely to extend an olive branch to Pakistan on terms and timelines that can be set by the Imran Khan government. Three factors in particular could play a role in India’s position on Pakistan bilateral relations in the coming year. First, the PTI government’s willingness to show tangible action towards restraining individuals and groups based in Pakistan from inciting violence and acts of terrorism in India. Second, whether the U.S. position on India- Pakistan relations continues to align with the Indian rhetoric of calling out Pakistan on supporting terrorist groups against India. And third, the satisfactory transition of Jammu and Kashmir into separate union territories as per the reorganization act of 2019. For Imran Khan, as the Kartarpur fervor dampens, domestic pressures may also play a role in shaping his government’s stance on relations with India- these pressures may include the urgent need to address the country’s economic crisis without losing the narrative on Kashmir. The Kartarpur episode shows that in the absence of a structured formal dialogue process, even the low-hanging fruits cannot create the necessary confidence and atmosphere for conflict resolution.

People in South Asia, home to a vast majority of the world’s poor, need the availability of employment opportunities more than anything else. This is essential so that no one takes interest in destructive activities like terrorism. If there is cooperation between India and Pakistan and not conflict, vast opportunities will open up for trade, travel and development that will create prosperity in both nations.

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Directive Principles of State Policy: Value & Importance

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INTRODUCTION

Directive Principles of State Policy provide essential guide-lines both for the state as well as the citizen for establishing economic democracy in India. The Constitution makers in India did not force on the people any particular economic system but they only tried to suggest a system which could be most suited to Indian conditions. With the passing of Forty-Second Constitution Amendment Act, it has been provided that India shall be a socialist democracy but socialism is not in the traditional sense but in the sense which suits Indian conditions. According to our Constitution Directive Principles, as against Fundamental Rights, are not justifiable in the courts of law. It is for the first time that a Part of Constitution (Part IV) has been devoted to these Principles. Earlier to this, the Government of India Act, 1935 also contained an Instrument of Instructions to the Governor-General and the Governors, but these instructions were for the executive government. Present Directives are however, for the Parliament and State Legislatures. Whereas the instrument of Instructions had no public opinion behind it, the directives have force of public opinion behind them. Constitution makers in India drew their inspiration from the Irish constitution for incorporating these directives in the constitution. There are some other countries of the world which have also incorporated directive principles in their constitution. Thus, Constitution of India is not the first constitution to contain Directive Principles of State Policy.

SOME DIRECTIVE PRINCIPLES

Constitution makers wanted to give the people of India maximum rights but due to country's social, economic, political and other conditions, it was not possible for them to give much to the people in the form of Fundamental Rights. Accordingly, whatever, they considered possible or feasible, they gave that the people in the form of Fundamental Rights and the rest they incorporated in the form of Directive Principles with the desire that with the passage of time, these might become justifiable rights. These Principles incorporate Gandhian philosophy and Socialistic ideas.

In more recent times, thinkers on political and social reforms who did not agree with the Marxian approach for the eradication of the ills and evils of modern society advocated such principles to be made the guiding force of state activity. The ideas of Jeremy Bentham, the political and social strand of the liberal and Radical parties of Western Europe, the major principles of Fabian Socialism and, to some extent, those of Guild socialism, are all taken to much of what is embodied in this part of the Constitution. Ivor Jennings claims that the ghosts of Sidney and Beatrice Webb stalk through the pages of the entire text and this part of the Constitution expresses Fabian Socialism without the word 'Socialism', for only the nationalization of the means of production, distribution and exchange is missing. But this would be to give an exaggerated importance to the Fabian influence, for one finds other documents and proclamations of more recent date that could have influenced the framers

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even more. Mention has already been made of the Irish Constitution. The Sapru Committee had recommended a division of fundamental rights into two classes—justifiable and nonjusticiable. The constitution Act of India, 1935, itself provided for 'Instruments of Instructions' which were a fruitful idea Ambedkar said.

It would however be wrong to suppose that the various principles embodied in this chapter are mere foreign borrowings or adaptations of principles of recent Western political or social philosophy. In fact, a number of these principles are entirely Indian, particularly those which formed an integral part of the very foundations of the national movement. Provisions dealing with the panchayats, cottage industries, prohibition, and protection against cow-slaughter, scheduled Castes, Scheduled Tribes and other socially and educationally backward classes are all formally and essentially Indian and some of these were the cherished ideals for the recognition of which Gandhi had striven throughout his life.

As the title itself indicates, the principles embodied in this chapter are directives to the various governments and government agencies (including even village panchayats) to be followed as fundamental in the governance of the country. It shall be the duty of the state to apply these principles in making laws. Thus, they place an ideal before the legislators of India while they frame new legislation for the country's administration. They lay down a code of conduct for the administrators of India while they discharge their responsibilities as agents of the sovereign power of the nation. In short, the directive Principles enshrine the fundamentals for the realization of which the state of India stands. They guide the path which will lead the people of India to achieve noble ideals which the Preamble of the Constitution proclaims: Justice, social, economic and political; Liberty: Equality; Fraternity. It is this realization that implied a member in the Constituent Assembly to demand the placing of this chapter immediately after the preamble in order to give it 'greater sanctity' than others. There was also a suggestion to change the title of the chapter to 'Fundamental Principles of State'.

The Advisory Committee on Fundamental Rights had made a definite recommendation to the Constituent Assembly for the inclusion of such a chapter. The committee reported: We have come to the conclusion that in addition to these fundamental rights, the Constitution should include certain directives of State Policy which, though not cognizable in any court of law, should be regarded as fundamental in the governance of the country.

There are nineteen articles of the Constitution that deal with the Directive Principles. These cover a wide range of State activity embracing economic, social, legal, educational, administrative, cultural and international problems. Speaking about the purpose of this chapter, Ambedkar said: In enacting this part of the Constitution, the Assembly is giving certain directions to the future legislature and the future executive to show in what manner they are to exercise the legislative and the executive power they will have. Surely it is to the intention to introduce in this part these principles mere pious declarations. It is the intention of this Assembly that in future both the legislature and the executive should not merely pay lip-service to these principles but that they should be made the basis of all legislative and executive action that they may be taking hereafter in the matter of the governance of the country.

THE VALUE & IMPORTANCE OF DIRECTIVE PRINCIPLES

A constitution framed in the middle of the 20th century could hardly do without chapter on directive principles of the type the Indian Constitution has. The establishment of political democracy is a fundamental aim of the Constitution. But that in itself is not enough. The sustaining forces of that political democracy have to be carefully built up. The most effective force which will sustain a political democracy is the simultaneous existence of an economic democracy. Where there is no economic democracy, political democracy is bound to degenerate soon into a dictatorship. If the fundamental rights guarantee a political democracy in India, the Directive Principles ensure the eventual emergence of an economic democracy to sustain the former. Thus, the Directive Principles of State Policy become the greatest guarantee for a genuine democracy in India. In the light of these considerations, it would betray a lack of discernment to consider these directives as a mere political manifesto without any legal sanction, or to characterize them as vague and indefinite serving no useful purpose, or to dismiss them as a mere moral homily. The last six decades and more demonstrate that such criticism has neither substance nor relevance today. If K.T. Shah were alive now, he should certainly have revised the opinion that he expressed in the Constituent Assembly that these principles "are like a cheque on a bank payable when able, only when the resources of the bank permit." Another apparently weighty criticism of the Directive Principles is implied in the question whether it is worth-while to insert in a Constitution of today a collection of political principles taken from the experience of the 19th century England or Western Europe., and to deem them to be suitable for India in the middle of the 20th century. The question whether they would be suitable for the 21st century when the Constitution is hoped to be still in operation is difficult to answer. It is probable that they may become outmoded by then. Who can predict the precise nature of the potentialities of an atomic or a hydrogen age? It may revolutionize the whole economic system of the present day and convert India into a land of plenty where all human wants in the material field are fully and instantaneously satisfied. In such a state of affairs, the Directive principles will indeed look not only outmoded but even reactionary. But as far as the 21st century was concerned, India had yet to reach in many spheres of economic activity a standard comparable to that which existed even in the 19th century in Western Europe. Thus, in sum it is clear that the Directive Principles reflect the 19th century political ideas of the West, their value in 21st century India was not lost. Besides, it is not quite correct to characterize these principles as borrowings from abroad. As has been pointed out elsewhere; there are many provisions in this chapter which prove the originality of the constitution and reflect the genius of the Indian people.

If and when the Directive Principles become outmoded, they can be suitably amended altogether abolished. The process of amending these provisions is simple. But by the time such amendments take place, India will have benefited immensely by the Directive Principles, and an economic democracy will have sent its roots deep into the Indian soil and the present form in which these principles are embodied will have realized its goal. Moreover, these principles would have become part and parcel of the Indian heritage. Thus, one can see the immense educative value of these principles. They will instill in the minds and thoughts of the coming generations of Indian youth the fundamental of a stable political order and a dynamic economic system. A constitution is primarily concerned with the



present. The future will take care of itself if the present is built on solid foundations. It is quite unnecessary, therefore, to think of the distant future with reference certain provisions of a constitutional document.

The real importance of the Directive Principles is that they contain the positive obligations of the State towards its citizens. No one can say that these obligations are of an insignificant type or that even if they are fulfilled, the pattern of society in India will still remain more or less the same. In fact they are revolutionary in character and yet to be achieved in a constitutional manner. Here in lies the real value of embodying these principles as an integral part of the Constitution. Through the Directive Principles of State Policy, the Constitution of India will steer clear of the two extremes, a proletarian dictatorship which destroys the liberty of the individual and a capitalist oligarchy which hampers the economic security of the masses.

CONCLUSION

These Directives thus constitute the national objectives and the national conscience and whosoever is victorious at the polls will not be free to violate them. According to Mr. Alladi Krishnaswamy Ayyer, "No ministry responsible to the people can afford light heartedly to ignore the provisions in Part IV of the Constitution." They have served as a guide for the Union Parliament and State legislatures. They are cited by the courts to support decisions. The governmental bodies have been invariably guided by these provisions."

If we make a critical estimate of the achievements of the present Government in implementing these policies, we feel encouraged Panchayats are being established in the remotest villages of our country. They are being resorted to their old pristine glory. Nationalization of certain industries, settingup of corporations. Heavier taxation of bigger incomes, recovery of deliberately concealed taxes and courageous steps to bring Dalmias in the clutches of law reflects that the State is doing its best to avoid concentration of wealth. The establishment of the poor house at the capital to wipe out great slur on the fair name of Indian democracy, Law begging, is a substantial step towards provision of adequate means of livelihood. The state owned factories, industries and Government Corporations are expanding, hence more and more people are getting employment. The employees State Insurance Act and the Workmen's Compensation Act are very significant steps to provide assistance to the workers during old age, disablement or undeserved want. The cottage industries are being encouraged. The Minimum Wages Act has been passed to ameliorate the lot of laborers of various categories. Efforts are being made to make available primary education to the children below the age of 14 years. The assistance to Scheduled Castes in the form of stipends and scholarships, remission of school and college fees, concession in the age and fees limits for those applying for jobs through Public Service Commission are effective steps to uplift the downtrodden class of Hindus. Agriculture is being organized on scientific lines. The attempts to improve the breed of the cattle are being made. Slaughter of cows and calves in some of the States has been prohibited. The Ancient Monuments Acts are steps in the direction of the fulfillment of the Directives mentioned in Article 49. In some of the States as Andhra Pradesh, Gujarat, Haryana, Punjab, Kerala, Madras, Karnataka and Maharashtra has been separated from the executive. In the fulfillment of principles pertaining to International peace and security, our Prime Minister's efforts can hardly be minimized. "Panch Sheel" is a laudable step in this direction. Pt. Nehru was hailed as a cultural





ambassador of spiritual East to the material West. He is raised to the pedestal of glory even by the pseudo-democrats of U.S.A. and Britain and orthodox and fanatic Muslims of the Arab World.

Still much is to be achieved. Political influences and economic and social disparities still persist. Standard of living of the people is yet to be raised. Unemployment is yet to be eradicated. Socialism is yet to be ushered in. But with all this, it can be safely concluded that government's efforts in the implementation of these objectives are really very commendable and fairly substantial.

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Buldhana



2020-21



'RESEARCH JOURNEY' International E- Research Journal
Impact Factor - (SJIF) - **6.625 (2019)**
Special Issue - 261 (B) : Use of ICT in Teaching - Learning
Peer Reviewed Journal

E-ISSN :
2348-7143
March 2021

ICT and Learner-Centric Approach in Post-Pandemic Higher Education in India

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The education system today all over the world is not what it used to be a year ago. The impact of Novel Corona Virus Pandemic has been so conspicuous in all walks of life that it completely altered almost all existing modes of human affairs. The Indian education system had been undergoing a lot of changes and up-gradations as ensued by Information Communication Technology in the recent decades. Particularly in last two decades i.e. from the beginning of the Twenty-First century the Indian pedagogy has been aspiring to modify and re-modify itself to cop up new challenges and gather enough strength to stand the international competition of educational standards. It is during this period that we witness a drastic change in the modes and methods of teaching as a result of expansion of communication technology. Recent advancements of technology along with explosion of knowledge and information have rendered a great impact on the way of teaching and learning.

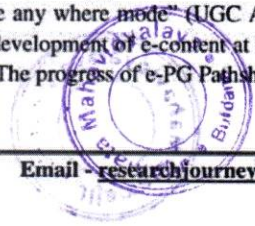
UGC Initiatives for Promotion of ICT in HEIs:

Promotion of ICT and its expansion in teaching- learning has been initiated and accelerated in Indian higher education system by the University Grants Commission through its Xth, XIth and XIIth plans by providing financial supports, expertise and guidance to higher education institutions. UGC in its 12th plan (2012-17) has emphasized the technology enabled open portal courseware for general higher education through National Knowledge Network (NKN) as implemented through NPTEL for engineering and technology courses.

Open portal courseware of Teaching-Learning resources for higher education through NKN for General higher education, similar to the National Programme on Technology Enhanced Learning for engineering need to be introduced as a new scheme. Vernacular technology assisted course-wares in regional languages shall also be developed to provide basic teaching learning modules for higher education institutions in different parts of the country. There shall also be an attempt to produce videographed lectures in different subject areas for the benefit of students studying in colleges located in backward areas. Mission mode programmes shall also be attempted to leverage technology for developing national level curriculum models, open portal for interactive courses and tools for participatory teaching and learning. (UGC 12th Plan)

Steps were taken to initiate and strengthen the incorporation of ICT enabled teaching-learning at universities and colleges by providing financial assistance from UGC and other government bodies too. As a result NKN has been able to connect over 1700 institutes and more than five crore researchers, teachers and students. The National Mission on Education through Information & Communication Technology (NME-ICT) which is "envisaged as a Centrally Sponsored Scheme to leverage the potential of ICT, in teaching and learning process for the benefit of all the learners in Higher Education institutions at any-time any where mode" (UGC AR-2016-17) awarded the project of e-PG Pathshala in 2011 for the development of e-content at the PG level in 77 subject in that year with a funding of 84 Crore. The progress of e-PG Pathshala has been

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quite satisfactory during last four years counting as much as 778 courses on 70 broad subjects developed and contributed by 5000+ faculty teachers across country.

Apart from this the Central MHRD and UGC have taken steps to promote self and collaborative learning as well as research activities by providing means and financial assistance to all those involved in higher education in the country. The government has also launched Massive Open Online Courses (MOOCs) through SWAYAM portal that provides an integrated platform for online courses, using information and communication technology (ICT). The UGC has reported that 58 courses are being offered through this portal benefitting more than 40000 learners registered from around 92 universities in 2019. The numbers of beneficiaries are rapidly increasing every year. If we look at the Annual Reports published by UGC for last five years, we can clearly understand the rapid progress of higher education in harnessing ICT for academic purposes.

In a very short while the new National Education Policy 2020 will come in force that has also reiterated the necessity of optimum incorporation technology in teaching learning practices all over the country. Many academic experts and thinkers have hailed the new Policy as a revolutionary step towards digital education through technology. The Policy envisages the establishment of the National Educational Technology Forum (NETF) which is expected to operate as a platform for interactions and exchange of ideas on employing the latest technology to enhance academic processes of teaching, learning, evaluation, research and also for administration of educational institutions and universities. This new Policy also recognizes the need to work in the fields of Artificial Intelligence, digitization of existing modes of administration in various sectors, adding impetus to Digital India Campaign through academic research. Therefore it has laid due emphasis on developing technology infrastructure by acknowledging that 'School complexes must become the nodal agency for reaching out to the unreached. For this, they must be equipped with electricity, computers/ smart phones or other access devices, and Internet access else the promise of reaching the unreached will not be realized' (National Education Policy 2019).

Thus the Policy provides a roadmap for development of infrastructures, supportive mechanisms and encouraging ambience for academic excellence by harnessing latest educational technology. The actual level of success in this regard depends on the means and mode of its implementation through a fruitful engagement of all regulatory authorities, industry and education centres and all other stakeholders.

A Reality Check:

Here it is very necessary to have a glance at the existing realities in the field of educational technology and the actual access to it for common men. The National Statistics Office, Government of India in its 'Key Indicators of Household Social Consumption on Education in India (NSS 75th Round)' indicated that an average of 9.9% of population of rural Indian society is able to operate computer while only 13% use Internet. The picture in urban societies is somewhat better with an average of 32.4% of population able to operate computer and 37.1% of them using Internet. The Internet and Mobile Association of India published its 'Digital in India 2019- Round 2 Report' that details on the internet size and penetration in urban and rural areas of India based on the data of year 2019. It gives us a clear idea about percentage of users of the existing infrastructure and facilities of ICT in the country. According to this report





99% of overall population uses their mobile phones for internet access, 6% urban and 2 % rural users have laptops, 3% urban and only 1% rural users have desktops while 1% of urban users have tablets. These figures, no doubt are changing rapidly with a remarkable growth in the users of internet and ICT tools in the country. It is estimated to grow more than 20% within a year. Above 500 million would be using smart phones and internet with internet penetration not less than 40% in the next year or so.

The picture so far is quite satisfactory as far as incorporation of ICT in teaching-learning, particularly in online and distance mode courses is concerned; however, it may grow grimmer when we shift attention to its actual classroom usage particularly in institutions working in semi-urban and rural areas of the country. With the present devastating background of the COVID 19 Pandemic situation the entire education system is called upon to step out of the traditional chalk and talk method of teaching-learning and adopt the latest technology so as to overcome the obstacles created by the pandemic in the form of continued spells of lockdowns, restrictions of distancing and number limitations and many other challenges of the day.

A Shift from Teachers to Learners:

The education institutions, therefore, are no more places where students come and learn and the teachers too are not just teaching personnel but their roles seem to be completely altered. As the famous educational thinker John Dewey said, 'If we teach today's students as we taught yesterday's, we rob them of tomorrow'. The education institutions must mould themselves into centres providing access to knowledge and skills not only on campuses but also off the campuses through online resources accessible from anywhere, anytime by the learners. Thus it is a high time to realize the long cherished goal of making education really learner-centric. The education institutions have to be more productive in terms of learning resources and inspire, motivate and facilitate learning. The teachers too have to adapt to their new roles as learning facilitators and co-learners with the students-creators of all new world for the learners.

Limitations and Challenges:

Educational technology and digital tools with all their boons and benefits, nevertheless, have some limitations and constrains. In a developing country like India we have to go a long way to fulfill the demands basic infrastructures for extensive use of ICT tools in general pedagogic practices. The limitations are also two-fold: the first being lack of necessary technical knowledge and skill in both teachers and learners and secondly, the meager availability of physical facilities.

Also it has been observed that the traditional methods of teaching-learning and the mechanisms that have been in practice for years cannot be replaced easily and quickly. It demands a widespread awareness and strong will power on the part of the authorities and the stakeholders to overcome the limitations and challenges. Nothing but a strong will with the fullest conviction is a word for all for the bright future of Indian education and academic excellence.

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'RESEARCH JOURNEY' International E-Research Journal
Impact Factor - (SJIF) - **6.625 (2019)**,
Special Issue - 261 (B) : Use of ICT in Teaching - Learning
Peer Reviewed Journal

E-ISSN :
2348-7143
March 2021

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LangLit

ISSN 2349-5189

An International Peer-Reviewed Open Access Journal



CONCEPT OF SELF-IDENTITY IN SHASHI DESHPANDE'S SELECT NOVELS

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ABSTRACT:

Self-Identity is depends on individual being, society and individual psychology. The modern Indian novelist Shashi Deshpande presented not only women's suffering and suffocation but also their aspiration for self identity, new vision and self consciousness in her novels. Shashi Deshpande's protagonists are submissive but know their power and limitations. Although, her protagonist tolerate a lot but ready to come out from this situation and desires for self-identity.

Keywords: self-Identity, Inner -Self, Patriarchal Society, Suppression, Exploitation, New Vision.

Self:

Generally speaking, the term self associates something is about me. Presenting oneself is common activity as well as psychological process. The term self includes both the actor 'who thinks' and the object that is 'thinking'. The self-concept is a representation of knowledge about us, our beliefs about our personality traits, abilities, values, aims and our role in any situation.

Self-Identity:

Self-identity is a complicated idea; even those who actively work on its face great difficulty to unravel it. Some aspects of self-identity can be understood and described by second person. While defining someone, we use the words that describe the job, hobbies, family ties, nationality, religious beliefs and groups. But thinking inner self of a human being and moral values cannot thoroughly be known by others.

The self has many facets that help to make up integral parts of it, such as self-awareness, Self-esteem, self-knowledge and self-perception. All parts of self-enable people to alter, change, add and modify aspects of them in order to gain social acceptance in society.

As humans, we all have a need to develop an individual identity that distinguishes us from others. Questions such as 'Who am I?' And 'What is my purpose in life?' All these are critical parts of understanding ourselves and defining our self-identity. One cannot define self-identity without the context of society. Earlier writers had often glorified women's suffering. However; Indian novelists in the last two or three decades have presented condition of woman with much greater reality. Modern Indian novelists presented women's struggle, women's craving for self-identity, self-consciousness, new vision, new role in society. The

Vol. 7 Issue 3

Website: www.LangLit.org

February, 2021

Contact No.: +91-989029 0602

Indexed: ICI, Google Scholar, Research Gate, Academia.edu, IBI, IIFC, DRJI

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IMPACT FACTOR – 5.61

LangLit

ISSN 2349-5189



An International Peer-Reviewed Open Access Journal

psychology of self is the study of either the cognitive, conative and affective representation of one's identity or the subject of experience. Society plays vital role while we evaluate and define our self-identity. Self can be created in society by comparing one to another by looks, work and behavior. Simone de Beauvoir's provocative declaration, "He is the Subject, he is the Absolute—she is the Other", signals the central importance of the self for feminism. To be the Other is to be a non-subject, a non-agent—in short, a mere thing. Women's selfhood has been systematically subordinated or even outright denied by law, customary practice, and cultural stereotypes. The topic of the self has been a basis of feminist philosophy.

Shashi Deshpande is a modern and award winning Indian novelist. She was awarded with Sahitya Academy award for her novel 'That Long Silence'. As a feminist novelist she has written about women's struggle and their suffering as well as presented women's quest for self-identity and freedom of life. Her women suffer in every role as a daughter, sister, wife and mother; they are subordinated and exploited by male dominated society. Although, her women tolerate too much in every role but they desire for self-identity. Shashi Deshpande discusses the issue of exploitation of women whether physical, mental or emotional by patriarchal society.

'A Matter of Time' (2001) is a predicament woman of three generations of the same family. The story of Kalyani and Sumi is a lot of suffering and losing their life in the hands of male in material life. Aru, the eldest daughter of Sumi, struggles hard to bring changes in the life of her grandmother Kalyani and mother Sumi. The protagonist of the novel is Sumi. She is directly exploited by her husband Gopal but Sumi suffers much because of Gopal's suddenly quit Sumi and her three daughters too, without any reason. Aru is an intelligent and educated eldest daughter of Sumi, suggests her mother to file a case against Gopal, her father, in a court. But Sumi disagrees and tells Aru,

"I just want to get on with my life she puts an arm around Aru's

shoulder, Let him go, Aru just let him go. This not good for you" (A Matter of Time, 61)

It shows Sumi's submissive nature, accepted her lonely life, ready to suffer but her Aru's nature is different. Through, Aru's character novelist articulates the feminist voice in the novel. Aru raises the questions against male dominated society for women exploitation and injustice. Aru is a modern and visionary girl. She joins a computer class and becomes a part of a woman's activist group. Aru wants to change the condition of her grandmother and mother life. She understands the importance man and woman equality in the sense of gender, rights, power. Aru aware about self-identity therefore she takes tough decision in her life.

In her another famous novel, Roots and Shadows, (1883) presented as a rebellious protagonist. Indu is a journalist, well educated and intelligent woman writer. The story of the novel is based on Indu's life, her struggle for success and problem of her marital life. Indu rebels against her traditional family to marry Jayant. Indu born in traditional family but doesn't want to compromise with tradition and culture on the basis of her womanhood. She doesn't follow the traditional path of her Kaki, Atya, Mini, Akka in the family therefore she says to Naren,

Vol. 7 Issue 3

Website: www.langlit.org



February, 2021

Contact No.: +91-9890290602

Indexed: ICI, Google Scholar, Research Gate, Academia.edu, IBI, IIFC, DRJI



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ISSN 2349-5189



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“Women, women, women....I got sick of it. There was nothing else.

*It was a kind of narcissism. And as if we had locked our self in a cage
and thrown away the key. I couldn't go on.” (Roots and Shadows, 78)*

It shows her anger about womanhood. Her inter cast marriage with Jayant breaks all tradition and social taboos. She protests against her family member and unites with Jayant. In marital life when she feels dissatisfied keeps relation with Naren. It breaks all social taboos without feel guilty. At the end when she realizes without Jayant her life is uncomplete. She decides to reconcile with Jayant. She realizes her inner self. Her realization takes place with the destruction of old house. She resolves the matter of pending property and decides to go home. The submissive and humble Indu of early days finally emerges as a bold and rebellious woman. She takes all decision of her life, resigns from her job and opposes male authority.

‘That Long Silence’ is one of the most celebrated novels of Shashi Deshpande. Jaya is a protagonist of the novel. She is contended house wife, having married with Mohan and blessed with two children, Rati and Rahul. Due to house chores and cares of family member her all desire are suppressed. Mohan, her husband stops her writing career because she refers marital life in the writing. The lot of suffering compels her to think about herself. It starts the process of self realization. She starts to face and compromise different life problems with willingness and determination. It is through, self confidence, self discovery and courage; Jaya tries to bring change in her life. She comes to know that no one but she has to fight her own battle of life. Jaya wants to raise the state of dependency and attain the state of self-realization. As Jaya states,

*“It is true, we don't change overnight. It's possible that we may not
change even over long periods of time. But we can always hope. Without
that life would be impossible. And if there is anything, I know now it is this.
(That Long Silence, 193)*

Jaya's transition has not been occurred suddenly, it takes lot of humiliation and suffering. The crisis in Jaya's life compels her to the idea of self-realization. In this adverse condition, she understands that she has potential to face any difficulty. She keeps silence on any event in the house. This silence made her strong but Mohan feels cheated.

In the famous novel of Shashi Deshpande, ‘The Dark Holds No Terror’, the protagonist Saru craves for self-identity and prepares to fight in family battle field, especially against her husband. In this novel, novelist uses stream of consciousness concept for narration. Shashi Deshpande explores the inner self and psyche of Saru. Her life is a journey from silent suffering and alienation to self-identity, self-discovery. Through, Saru's character Shashi Deshpande declares woman's life is her own and she has every right to live their life happily. Saru life turns from suffering and suppression to transformation and then self-identity, self-assertion.



Vol. 7 Issue 3

Website: www.langlit.org

February, 2021

Contact No.: +91-989029 0602

Indexed: ICI, Google Scholar, Research Gate, Academia.edu, IBI, IIFC, DRJI



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ISSN 2349-5189



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'The Dark Holds No Terror' deals with protagonist Saru, a successful lady doctor and her husband Manohar is underpaid college professor. At the very outset of the novel Saru returns to her father's home after fifteen years. Once she took oath never to return again but due to suffering and her husband's sexual sadism she returns home. In the halt at her father's house, she realized self-identity, self-hood. She reminds her mother's rough behavior towards her and how she discriminates between her and her brother Dhurva. Her mother never gives her motherly love after Dhurva's death. In her marriage also her mother doesn't support Saru but decided to never meet her. In her marital life also she is mentally and sexually harassed by her own husband. Saru introspects herself, thinks her past and present reality, she says,

My life is my own....somehow she felt as if she had found it now, the

Connecting link. It means you are not just a strutting grimacing puppet,

Standing futility on stage for a brief while, between areas of darkness.

If I have been puppet it is because I made myself one.

(The Dark Holds No Terror, 220)

Saru realizes her condition, in the initial years of marriage she enjoys her life but later her marital happiness declines gradually. Manu feels humiliated when Saru become popular doctor and earn more than him. He tries to show his masculinity by sexual sadism at every night. This strange behavior of Manu compels her to return her father's home where she understood she has to solve her own problem. Neither forgiveness nor reconciliation, nor escapism like divorce could solve the issue or permanent solution. The real solution has to be search within Saru's personality. The real darkness is within the mind of Saru, can be vanished by lit up the light the candle of self-identity and asserting herself.

In the Indian writing in English, the theme of the novel is exploitation, injustice, subordination of women none other than their own husband which shows gender discrimination and victimization is prevalent theme of the writing. But Shashi Shashi Deshpande is a popular novelist having deep sense and understanding about female psyche and inner self. Craves for self-identity, liberation and self assertion is the ever present theme of the Shashi Deshpande's various novels. Indu, Jaya, Sumi, Aru and Saru are the various protagonists of her novels; all works are the life journey from suppression, exploitation, suffering to self-discovery, self-identity and self assertion.

In 'Roots and Shadows', Indu contemplates and goes towards Jayant with positive reunion for renewal of life. Her self-realization and reunion with Jayant gives security and warmth to the Indu for her future life. In the novel, 'That Long Silence' Jaya comes to know how to resolve the problems in her life. She resists to her husband by remaining silence. Silence is one of the best weapons of her in the family battle.

Saru evaluates her childhood and marital life calmly. She comes out of the fear, confusion and sexual harassment from her husband. Now she is ready to ignore her children and their letters. The self-identity of Saru suggests that she has overcome her earlier hesitation and is now prepare to face her husband. Now days, feminists believe that women has proved that

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Website: www.langlit.org

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February, 2021

Contact No.: +91-9890290602

Indexed: ICI, Google Scholar, Research Gate, Academia.edu, IBI, IIFC, DRJI



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LangLit

ISSN 2349-5189



An International Peer-Reviewed Open Access Journal

they are as capable as men in every arena of human life. Aru, in 'A Matter of Time' shows modern attitude towards life and ready to defend male dominated society.

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Website: www.langlit.org

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February, 2021

Contact No.: +91-989029 0602

Indexed: JCI, Google Scholar, Research Gate, Academia.edu, IBI, IIFC, DRJI

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2020-21

Impact of Covid-19 Pandemic on the World Economy

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Introduction:

COVID-19 brought the global economy to a sudden stop, causing shocks to supply and demand. Starting in January 2020, country after country suffered outbreaks of the new Covid 19, with each facing epidemiological shocks that led to economic and financial shocks as a consequence. How quickly and to what extent will national economies recover after the pandemic has passed? This will depend on success in containing the Covid 19 and on exit strategies, as well as on the effectiveness of policies designed to deal with the negative economic effects of the Covid 19. The impact of Covid 19 on the global economy will extend beyond 2020. According to forecasts from the International Monetary Fund and World Bank, GDP per capita at the end of 2021 is still expected to be lower than December 2019 in most countries. Emerging markets and other developing countries, in addition to facing difficulties in dealing with their own Covid 19 outbreaks, have suffered additional shocks from abroad. In their cases, the new Covid 19 brought a perfect storm. One can foresee a post- Covid 19 global economy marked by higher levels of public and private debt, acceleration in digitization processes, and less globalization.

❖ The Impact of Covid-19 on the World Economy:

1. Crisis and Recovery in the Economies Impacted by Covid 19:

1.1 Why and how to flatten the Covid 19 curves:

The Covid 19 crisis is primarily a public health issue, demanding containment policies that have inevitably caused shocks to economic activity. A major reason for containment is the widespread perception that, given the epidemiological dynamics of infection so far exhibited by Covid 19 in most places where it has landed—and corresponding numbers of people in need of clinical care—existing local clinical care capacities tend to be swamped and death tolls are higher in a 'do-nothing' scenario. Therefore, policies to flatten the pandemic curve and gain time are crucial, regardless of whether or not they reduce absolute numbers of infections.

1.2 The pandemic curve generates a recession curve that also needs to be flattened:

The Covid 19 pandemic has led to both negative demand and supply shocks to the economy. While demand and supply would of course be negatively impacted in a 'do-nothing' scenario, the impact tends to be exacerbated by social-distancing policies. The Covid 19 recession has a disruptive nature that may leave scars, impeding a return to where the economy was prior to the shock. Solvent but suddenly illiquid firms may be bankrupted, unemployment is rising at a fast pace, and demand and revenues for small businesses have hastily vanished. That is why an extraordinary role for the state as a catastrophe insurer has come to the fore, providing fiscal support—additional resources to healthcare systems, income transfers to crisis-affected people, tax relief—and credit available at favorable conditions to vulnerable firms. These emergency and temporary measures are geared to minimizing the disruptive consequences of the temporary but impactful sudden stop to the economy.

1.3 What will be the shape of the post- Covid 19 economic recovery?

Data on the first-quarter 2020 GDP performance of major economies has shown how significant the impact of COVID-19 has been on economic activity and jobs, with large contractions across the board. The ongoing global recession is poised to be worse than the Great Recession after the 2008-09 global financial crisis, especially from the standpoint of emerging-market and developing economies. The depth and speed of the GDP decline will rival that of the Great Depression of the 1930s. A post-crisis recovery is expected to begin in the second half of the year, at least in those





countries where the Covid 19 outbreak may be considered to have passed and policies to flatten the pandemic curve can be relaxed. The shocks caused by COVID-19 are profound while they last but will invariably be temporary. Let us mention four possible stylized formats for the evolution of GDP as recoveries take hold, taken from Sheiner and Yilla (2020). The most optimistic is a V-shaped recovery. In this scenario, after suffering a strong blow during the pandemic, the economy soon returns to its previous trajectory. The loss of GDP during the period of restrictions—due to supply shocks and pent-up demand—is definitive. However, if there are no lasting consequences from the virus period and the corresponding economic impact on the production system and on economic agents' conditions, everything returns to the previous normal. However, if there are no lasting consequences from the virus period and the corresponding economic impact on the production system and on economic agents' conditions, everything returns to the previous normal.

2. COVID-19 and global growth

The IMF's estimate of the global economy growing at -3 per cent in 2020 is an outcome "far worse" than the 2009 global financial crises. Economies such as the US, Japan, the UK, Germany, France, Italy and Spain are expected to contract this year by 5.9, 5.2, 6.5, 7, 7.2, 9.1 and 8 per cent respectively.

Advanced economies have been hit harder, and together they are expected to grow by -6 per cent in 2020. Emerging markets and developing economies are expected to contract by -1 per cent. If China is excluded from this pool of countries, the growth rate for 2020 is expected to be -2.2 per cent.

China's GDP dropped by 36.6 per cent in the first quarter of 2020, while South Korea's output fell by 5.5 per cent, since the country didn't impose a lockdown but followed a strategy of aggressive testing, contact tracing and quarantining.

In Europe, the GDPs of France, Spain and Italy fell by 21.3, 19.2 and 17.5 per cent respectively.

3. The Covid 19 Perfect Storm in Developing Countries:

The global footprint of Covid 19 is clear. But in developing countries, in addition to the challenges of dealing with their domestic COVID-19 outbreaks, negative shocks preceded the arrival of the virus in their territories. The perfect storm came in the wake of the decline in GDP in projections for 2020 released by the IMF in April.

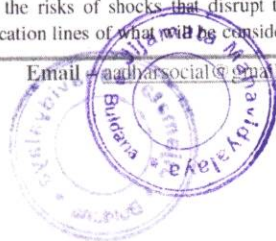
3.1 Flattening Covid 19 curves tends to be more difficult in developing countries. Flattening the curves of pandemic and Covid 19 recession tends to be more difficult in developing countries. The flattening of the infection curve—that is, slowing down the rate of contamination and infections—is essential to avoid overloading of the clinical hospital capacity in developing countries and the death toll comes with infections. While, rich countries have an average of more than four hospital beds for every thousand inhabitants, the number drops to 0.6 in low-income countries. The ability to treat critically ill patients with COVID-19 is further reduced. Social detachment policies are also more difficult to implement when a substantial part of the population lives in slums. In turn, selective forms of isolation are difficult to implement, in the absence of technology and the public capacity to implement them, as in Singapore, South Korea, or Germany. Measures to contain the pandemic via social/physical distancing have particularly affected the parts of the population whose income depends on their physical mobility, making it also essential to flatten the curve of the recession that accompanies the curve of the pandemic. One difficulty arises from the informality of work in developing countries, as levels of informal occupation vary from 50% to 90% of the total. Informal workers do not have benefits such as unemployment insurance, health insurance, or paid holidays. The informality of work implies that relief and recovery policies aimed at formal work, including raising unemployment insurance, reducing payroll taxes, and extending paid medical leave, are of limited scope.





4. Higher Debt, Deeper Digitization, and Less Globalization Will be Covid 19 Legacies:

Three features of the post-pandemic global economy can already be anticipated: the worldwide rise in public and private debt levels, accelerated digitization, and a partial reversal of globalization. The first arises from the public sector's role as the ultimate insurer against catastrophes, government policies to smooth pandemic curves, and the Covid 19 recession. These will leave a legacy of massive public-sector debt worldwide. Lower tax revenues and higher social and health expenditures reflect the choice of trying to avoid widespread destruction of people's productive and livelihood capacity during the pandemic. On the private-sector side, indebtedness will be the way to survive the sudden stop, if the result is not to be bankruptcy or closure. The burden of meeting higher levels of public debt will be mitigated by the expected continuation of low basic interest rates in most advanced countries. However, even governments with better credit risk ratings will face debt accumulation. And sovereign debt stress is likely to increase in many other cases. Spending cuts to contain fiscal deficits will be very costly in terms of political capital, especially after a crisis that will leave behind higher degrees of income inequality, and which is occurring after a recent period of spending restraint in many countries. Among advanced economies, the trend in recent decades has been to reduce corporate and personal income taxes. Reversing these reductions is an obvious option to fill the fiscal gap caused by the Covid 19 . Ongoing demographic trends already pointed to the need to find new ways to cover growing public spending. The Covid 19 crisis will accelerate this search. However, to prevent fiscal wars between countries undermining that strategy, plural-national consistency through tacit or explicit cooperation will be a necessary condition. Take, for example, fiscal challenges in the Euro zone, which have been compounded by the Covid 19 crisis. Highly impacted countries—including Italy and Spain—were already showing fiscal vulnerability before the virus outbreak, despite years of fiscal restrictions. The divide between countries over metallization of debt at the Euro zone level, and the country-specific tax structures required by some—Germany—will require resolution. The announcement by the European Central Bank that it will buy another €600 billion in bonds, together with the proposal announced on May 27 by the European Commission to create a new European Union recovery fund of €750 billion to help the countries most affected by the pandemic, pushed the problem forward. Greater intensity and frequency of stresses in the public and foreign debts of the poorest countries will also be present. The external debt of poor countries had already increased substantially since the 2008-09 global financial crisis. The G20's postponement of the payment of its official bilateral debt this year eased the service burden in the short term, but the debt will continue to accumulate and the underlying debt trajectories will still need to be dealt with after the pandemic. A key component in this regard will be China's role as a creditor. Its financial exposure to developing countries through credit lines and loan agreements—often linked to commercial projects at market rates and backed by guarantees—has increased in recent history. The second result from Covid 19 will be acceleration of digitization in production processes and in the provision of public services. Digitization processes taking place during the pandemic and the confinements tend to remain, to a great extent, definitively extending in areas such as education. To some extent, things like timework happening during the crisis will not reverse entirely. There will be destruction of 'analogue' jobs, while jobs and opportunities for entrepreneurship that require digital training will be created. Adapting the workforce to this new reality will be among the challenges highlighted by COVID-19. A third post- Covid 19 characteristic is likely to be a partial setback of productive integration across borders, which marked globalization in the decades before the global financial crisis and which has been under pressure to reverse ever since. In some cases, including medical equipment and medicines, in addition to high technology, the primacy of efficiency and cost minimization will give way to security against the risks of shocks that disrupt the availability of imports. It remains to be seen how far the demarcation lines of what will be considered 'strategic' by





different countries will extend, in terms of the activities they need to re-shore. A key part of this issue is expected to be the intensification of the technological dispute between the United States and China (Canto, 2019). The coronavirus pandemic could also accentuate the 'moving contradiction' between a reinforcement of reorientation within countries and the need for policy coordination between countries in many areas. Dealing with challenges, including future pandemics, climate change, cyber security, terrorism, and migration, will require more multilateralism or pluri-lateralism and much less nationalism. This will mean that the lessons of Covid 19, which has encouraged national solutions, will have to be learned carefully.

5. Oil and natural gas:

Due to the fall in travel, global industrial activity has been affected. Oil prices fell further in March as the transportation section, which accounts for 60 per cent of the oil demand, was hit due to several countries imposing lockdowns. Not only oil, early this year in China, due to Covid-19-related containment measures, the demand for natural gas fell, as a result of which many Chinese LNG buyers halted their imports as storage tanks filled.

6. Industrial Metals:

Due to lockdowns in China, followed by in the US and Europe, the demand for industrial metals reduced as factories shut down. As per IMF, China accounts for roughly half of the global demand for industrial metals.

7. Food and beverages:

IMF projects a decrease in food prices by 2.6 per cent in 2020, caused by supply chain disruptions, border delays, food security concerns in regions affected by Covid-19 and export restrictions.

In the lockdown period, while the price of cereals, oranges, seafood and arabica coffee has increased, prices of tea, meat, wool and cotton have declined. Further, the decline in oil prices has put a downward pressure on the prices for palm oil, soy oil, sugar and corn.

8. Three main channels of the global economy will be disrupted: demand, supply, and finance:

On the demand side, a combination of reduced income and fear of contagion will result in lower private spending. Although some of these effects might be offset by increased government spending, the COVID-19 shock's net demand effect is expected to be negative in the short run.

This could be amplified by negative supply side effects, attributable to a sudden halt in manufacturing activities in the most affected regions and the resulting bottlenecks in global value chains. If left unaddressed, such disruptions will in turn trigger widespread factory closures due to the lack of intermediary inputs, even in areas less affected by the virus.

Lastly, increased risk aversion and a flight-to-liquidity in the face of uncertainty caused by the COVID-19 shock, the financial markets stress will weigh heavily on the global economy. Further fluctuations are expected in the foreign exchange market.

9. Substantial increase in unemployment:

A substantial increase in global unemployment seems almost certain. The ILO expects the pandemic to disproportionately affect not only those workers with underlying health conditions, but also young people who are more vulnerable to decreased labour demand, women, who are over-represented in those sectors that are likely to be affected most (such as services or in occupations on the front lines of the pandemic, e.g. nurses), as well as unprotected workers in the so-called 'gig economy' and migrants.

10. Capital flight:

The pandemic has already triggered capital flight and a sharp reversal of international investment in emerging markets. Whereas a group of 24 emerging markets including China, India, South Africa and Brazil, had a net inflow of investments of US\$79bn in 2019, US\$70bn in investments had already exited those countries in the last two months alone according to the Institute





of International Finance. With this in mind, the decision by the G20 governments to "do whatever it takes" to minimize the social and economic fallout due to the coronavirus – and most importantly, to ensure cross-border flows of vital medical supplies, agricultural products and other goods and services – was welcomed.

11. Possibility of insolvency and default:

This capital flight has reignited fears that countries such as Argentina, Turkey or South Africa, could be sliding toward insolvency and default soon. This could be further accelerated by currency depreciations in these countries. The Argentine peso continued to devalue and decreased by another 6 per cent against the dollar this year alone. Similarly, the Turkish lira has dropped by 10 per cent since January due to investors pulling out money and Turkish companies facing bankruptcy.

While these are only two examples, the situation is becoming equally dire in many other low- and middle-income countries and requires urgent attention from policymakers and the international community.

12. Significant contraction of FDI:

The effect of the pandemic is similarly dramatic when we look at foreign direct investment (FDI). On 26 March, estimated a collapse of global FDI by – 30 per cent to – 40 per cent during 2020–2021, much more than the previous projections of -5 per cent to -15 per cent two weeks earlier.

While those countries most severely affected by COVID-19 will be hardest hit, other countries are also likely to feel the virus's full impact as supply chain disruptions on investment prospects. Over two-thirds of the 100 multinational companies tracked by have issued statements on the effects the virus has had on their business. Many are reducing capital expenditure in affected areas, and to date, 41 have issued profit alerts. Lower profits translate into lower reinvested earnings, a major component of FDI.

A wider sample of the top 5,000 listed companies shows that the earnings forecasts for the fiscal year 2020 have been revised down by an average of 30 per cent. The hardest hit sectors are the energy and basic materials industries (-208 per cent for energy, with an additional shock caused by the recent drop in oil prices), airlines (-116 per cent) and the automotive industry (-47 per cent).

13. Trouble in global value chains and supply chain contagion:

As outlined by Richard Baldwin and Eiichi Tomiura in the hardest hit countries account for the majority of global GDP, manufacturing production and exports. Furthermore, the mitigation policies introduced will result in a global slowdown in aggregate demand. Global supply chains have fundamentally changed how supply shocks propagate. As industrial parts and components are increasingly traded, a supply shock in a globally integrated economy is likely to create 'supply chain contagion' via the trade in intermediate goods.

Baldwin and Tomiura develop different supply chain scenarios based on the WTO's and by citing They also use data from the to quantify the importance of inter-linkages for different countries. The authors find a mixed picture for trade in services, as some industries such as tourism and air travel will be hit hard, while others, such as ICT and medical services, will not be as affected.

14. Impact on production and trade:

According to reports by academics and practitioners on the impacts of the coronavirus, the virus implies both a demand and a supply shock.

14.1 The supply shock:

From the supply side perspective, production is affected, on the one hand, because of reductions in labour supply as a consequence of the number of workers infected, thus reducing the number of people available to work, and because value chains are disrupted, on the other. Countries that rely on equipment and components from regions affected by the virus may experience disruptions in the production process.



14.2 The demand shock:

Demand for manufactured goods could reduce as a consequence of the pandemic. This usually occurs for two reasons:

1. the propensity to consume decreases as workers who are required to stay at home in support of "social distancing" measures tend to prioritize saving over spending.
2. firms that are experiencing disruptions in the production process may decrease their consumption of intermediate goods.

Supply and demand shocks can manifest in different ways across countries and different industries. The differences between various regions could be as follows:

- Economies like China, Europe and the United States are mostly affected by direct impacts on their population's health condition;
- The majority of developing countries are mostly affected, for the moment, by indirect impacts relating to their level of inter-linkages with countries affected by the coronavirus, i.e. their demand for goods or the supply of goods and services. However, as COVID-19 further spreads to developing countries, the direct impacts on these countries are likely to increase.
- It is plausible to assume that resource-rich developing countries will be also affected by a reduction in commodity prices (e.g. copper, oil) driven by reduced international demand for such goods, and that developed countries will experience a drop in the production of transformed manufactured goods.

15. Other Affected Sectors:

Public concerns over the spread of the virus have led to self-quarantines, reductions in airline and cruise liner travel, the closing of such institutions as the Louvre, and the rescheduling of theatrical releases of movies, including the sequel in the iconic James Bond series (titled, "No Time to Die"). School closures are affecting 1.5 billion children worldwide, challenging parental leave policies. Other countries are limiting the size of public gatherings. Some businesses are considering new approaches to managing their workforces and work methods. These techniques build on, or in some places replace, such standard techniques as self quarantines and travel bans. Some firms are adopting an open-leave policy to ensure employees receive sick pay if they are, or suspect they are, infected. Other firms are adopting paid sick leave policies to encourage sick employees to stay home and are adopting remote working policies. Microsoft and Amazon have instructed all of their Seattle-based employees to work from home until the end of March 2020. The drop in business and tourist travel has caused a sharp drop in scheduled airline flights by as much as 10%; airlines are estimating they could lose \$113 billion in 2020 (an estimate that could prove optimistic given the Trump Administration's announced restrictions on flights from Europe to the United States and the growing list of countries that are similarly restricting flights), while airports in Europe estimate they could lose \$4.3 billion in revenue due to fewer flights. Industry experts estimate that many airlines will be in bankruptcy by May 2020 under current conditions as a result of travel restrictions imposed by a growing number of countries. The loss of Chinese tourists is another economic blow to countries in Asia and elsewhere that have benefitted from the growing market for Chinese tourists and the stimulus such tourism has provided. The decline in industrial activity has reduced demand for energy products such as crude oil, causing prices to drop sharply, which negatively affects energy producers, renewable energy producers, and electric vehicle manufacturers, but generally is positive for consumers and businesses. Saudi Arabia is pushing other OPEC (Organization of the Petroleum Exporting Countries) members collectively to reduce output by 1.5 million barrels a day to raise market prices. U.S. shale oil producers, who are not represented by OPEC, support the move to raise prices. An unwillingness by Russia to agree to output reductions added to other downward pressures on oil prices and caused Saudi Arabia to engage in a price war with Russia that drove oil prices below \$25 per barrel at times, half the estimated \$50 per barrel break-even point for most oil producing





countries. Rising oil supplies and falling demand combined to create an estimated surplus of 25 million barrels a day and overwhelmed storage capacity at times and challenged the viability of U.S. shale oil production. In 2019, low energy prices combined with high debt levels reportedly caused U.S. energy producers to reduce their spending on capital equipment, reduced their profits and, in some cases, led to bankruptcies. Reportedly, in late 2019 and early 2020, bond and equity investors, as well as banks, reduced their lending to shale oil producers and other energy producers that typically use oil and gas reserves as collateral. Disruptions to industrial activity in China reportedly caused delays in shipments of computers, cell phones, toys, and medical equipment. Factory output in China, the United States, Japan, and South Korea all declined in the first months of 2020. Reduced Chinese agricultural exports, including to Japan, are leading to shortages in some commodities. In addition, numerous auto producers have faced shortages in parts and other supplies that have been sourced in China. Reductions in international trade have also affected ocean freight prices. Some freight companies argue they could be forced to shutter if prices did not rebound quickly. Disruptions in the movements of goods and people reportedly caused some companies to reassess how international they want their supply chains to be. According to some estimates, nearly every member of the Fortune 1000 has been affected by disruptions in production in China.

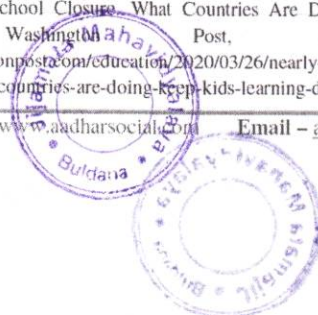
Conclusion:

Although it is difficult to determine the exact impact the coronavirus will have on the world's economy, it is clear the impact will be substantial and pervasive. And it appears the worst is yet to come. Investors worldwide are closely watching the coronavirus's impact on world markets. The US stock market has shown substantial volatility, with the Dow Jones Industrial Average suffering its worst single-day losses since the 2008 financial crisis.

Even if the tide turns quickly and the virus's spread is curtailed, its impact will likely be long-lasting. Some entities with thin margins and weak balance sheets will have been driven out of business. Others may need to consider bankruptcy protection to address liquidity issues, or supply chain or vendor disruptions. The Dentons Restructuring, Insolvency & Bankruptcy Team is here to help you and your clients navigate the inevitable challenges ahead.

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2020-21



IJARESM

ISSN: 2455-6211, New Delhi, India
International Journal of All Research Education & Scientific Methods
An ISO & UGC Certified Peer-Reviewed Multi-disciplinary Journal

Certificate of Publication

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सहाय्यक प्राध्यापक (वाणिज्य)

TITLE OF PAPER

योग अभ्यास और योग अनुसंधान की वर्तमान स्थिति

has been published in

IJARESM, Impact Factor: 7.429, Volume 9 Issue 3, March - 2021

Paper Id: IJARESM/Mar21


Date: 19-03-2021



Website: www.ijaresm.com
Email: editor.ijaresm@gmail.com



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योग अभ्यास और योग अनुसंधान की वर्तमान स्थिति

प्रा. गणेश एस. किरोचे

सहाय्यक प्राध्यापक (वाणिज्य)

प्रस्तावना

मानव की कल्याण में योग की भूमिका को ध्यान में रखते हुए, 11 दिसंबर 2014 को संयुक्त राष्ट्र महासभा ने 21 जून को अंतरराष्ट्रीय योग दिवस के रूप में घोषित किया जिसे पहली बार 2015 में 192 देशों द्वारा मनाया गया था, जो अब तक का सबसे बड़ा कार्यक्रम है। आम तौर पर, योग का प्रयोग आसन, प्राणायाम या चिकित्सकीय उद्देश्यों के लिए ध्यान की छोटी अवधि के रूप में किया जाता है। इसके अलावा, योग के बारे में सामान्य धारणा भी वही है, जो सही नहीं है। योग वास्तव में सर्वोच्च चेतना के साथ व्यक्तिगत चेतना का संघ है। इसमें योग के आठ भाग या अंग शामिल हैं, जिनमें यम, नियमा, आसन, प्राणायाम, प्रतिहार, धरणा, ध्यान, और समाधि शामिल हैं। इनकी गहन अभ्यास आत्म-प्राप्ति के कारण होती है, जो योग का प्राथमिक लक्ष्य है। रनस और योग के लक्ष्य पर एक विवेचनात्मक रूप से पता चलता है कि यह जीवन का एक समग्र तरीका है जो पूर्ण शारीरिक, सामाजिक, मानसिक, और आध्यात्मिक कल्याण और प्रकृति के अनुरूप सद्भावना की स्थिति में अग्रणी है। कॉलेज के छात्रों में तनाव और चिंता पर दिमाग में ध्यान के प्रभावों के आधार पर एक हालिया रिपोर्ट में पता चला कि यह प्रभावी रूप से चिंता और तनाव को कम करता है, और मानसिकता को बढ़ाता है जबकि शारीरिक तनाव पर इसका असर असंगत पाया जाता है [1,2]। यह आधुनिक सभ्यता के विशुद्ध रूप से आर्थिक और भौतिक विकास लक्ष्य के विपरीत है, जिसने सामाजिक अथाति और पारिस्थितिक विनाश [3] लाया है। योग का न केवल भारत में इसका लाभ उठाया जा रहा है, जहाँ यह परंपरागत रूप से परिचित है लेकिन अमेरिका, ब्रिटेन और ऑस्ट्रेलिया में भी है। अल्पकालिक अध्ययनों में दिखाए गए लाभों को ध्यान में रखते हुए, योग अभ्यास और अनुवर्ती अनुदान के लिए समर्थन के साथ दीर्घकालिक अध्ययन की आवश्यकता है और इसके लिए शोधकर्ता, सरकार, समाज और वित्त पोषण एजेंसी के हिस्से पर सामूहिक प्रयास की आवश्यकता है [4]। राष्ट्रीय स्थिति शारीरिक और मानसिक स्वास्थ्य में योग की भूमिका की खोज के लिए भारत में कई शोध प्रथाएं प्रगति पर हैं। आयुष मंत्रालय, भारत सरकार योग विज्ञान के विभिन्न क्षेत्रों पर शोध का समर्थन कर रही है। हाल ही में, विज्ञान और प्रौद्योगिकी विभाग (डीएसटी) ने योग अनुसंधान को बढ़ावा देने के लिए योग और ध्यान के विज्ञान और प्रौद्योगिकी नामक एक योजना भी शुरू की। (science and technology of yoga and meditation SATYAM)

भारतीय प्रधान मंत्री नरेंद्र मोदी ने संयुक्त राष्ट्र महासभा के दौरान अपने भाषण में कहा कि योग केवल फिटनेस या व्यायाम के बारे में नहीं है, यह किसी की जीवनशैली को बदलने के बारे में है, और स्वामी विवेकानंद द्वारा पश्चिम में पेश किए गए प्राचीन अभ्यास के लिए प्लगिंग करने पर जोर दिया गया है। हाल ही में, उन्होंने जोर देकर कहा कि योग हमारा प्राचीन चिकित्सा उपचार है और यह सभी स्कूलों / कॉलेजों के पाठ्यक्रम में अनिवार्य होना चाहिए। इस संबंध में, विश्वविद्यालय अनुदान आयोग (यूजीसी) ने सार्वजनिक अनुदान विश्वविद्यालयों के पाठ्यक्रम में योग को शामिल करने की योजना बनाई है, जो कि प्राचीन अनुशासन और दुनिया भर में इसकी बढ़ती लोकप्रियता के लिए प्रधान मंत्री के धक्का पर नकद लगाने की उम्मीद है। ब्राजेश कुमार की रिपोर्ट के अनुसार [5], उच्च शिक्षा के लिए शीर्ष नियामक निकाय ने 2016-17 शैक्षणिक सत्र से सभी 40 केंद्रीय विश्वविद्यालयों में योग में वीएससी और एमएससी शुरू करने का प्रस्ताव तैयार किया है, और बाद में, राज्य और समन्वय विश्वविद्यालयों में। यह जरूरी है कि भारतीय विश्वविद्यालय मानव स्वास्थ्य पर योग और ध्यान के सकारात्मक प्रभावों के वैज्ञानिक साध्य को मजबूत बनाने में संलग्न हों। योग में शिक्षा और अभ्यास को आगे बढ़ाने के लिए, सार्वजनिक वित्त पोषित विश्वविद्यालयों में योग के केंद्रों और विभागों को स्थापित करने का प्रस्ताव है।

अंतर्राष्ट्रीय स्थिति

न केवल भारत में बल्कि दुनिया के वैज्ञानिकों ने साबित करने के करीब होकर योगियों को सदियों से सच साबित किया है और कैसे योग और ध्यान तनाव और बीमारी से बच सकते हैं? अमेरिका में योग अभ्यास के लिए रोग की रोकथाम और पीठ दर्द राहत सबसे महत्वपूर्ण स्वास्थ्य कारण हैं [6]। हार्वर्ड मेडिकल स्कूल के एक मनोचिकित्सक डॉ. डेनिंगर ने कालक्रम पर जोर दिया [7] में जीन और मस्तिष्क गतिविधि पर योग और ध्यान की भूमिका का अध्ययन किया। इस अध्ययन में पाया गया कि योग अभ्यास (दिमागी-शरीर तकनीक) तनाव और प्रतिरक्षा कार्य से जुड़ी कुछ जीनों को चालू और बंद कर सकती है। योग और ध्यान के मानसिक स्वास्थ्य लाभों के आधार पर पहले के अध्ययनों ने मुख्य रूप से प्रतिभागी प्रश्रवली, हृदय गति और रक्तचाप की निगरानी पर ब्लंट टूल्स पर भरसा किया है। हालांकि, डेनिंगर एट अल द्वारा उन्नत न्यूरो-इमेजिंग और जीनोमिक्स प्रौद्योगिकी का उपयोग किया। वैज्ञानिकों को शारीरिक परिवर्तनों को अधिक विस्तार से मापने की अनुमति दी। अध्ययन में आगे पता चला कि योग ने जीन एक्सप्रेशन में ही नहीं बल्कि पूरे शरीर में वास्तविक जैविक प्रभाव हैं। तनाव में कमी के माध्यम से अवसाद की शुरुआत को रोकने के लिए दवाइयों की दवाएं अभी भी आवश्यक हैं। हालांकि,





योग और ध्यान उपयोगी जोड़ हैं और मनोवैज्ञानिक स्थितियों में एक मानार्थ दवा के रूप में कार्य करते हैं। यह पाया गया है कि योग का एक रूप कुंडलिनी, ध्यान, श्वास अभ्यास और मुद्राओं के अलावा मंत्रों के गायन को शामिल करता है। मजबूत ध्यान घटक के कारण, कुंडलिनी योग अभ्यास ऊर्जा चयापचय और इंसुलिन स्राव में शामिल जीन की अभिव्यक्ति को बढ़ा सकता है और जीवाणु प्रतिक्रिया और तनाव से जीन की अभिव्यक्ति को कम कर सकता है। कुंडलिनी प्रभावों के साथ दिमागीपन और रहस्यमय अनुभवों को बढ़ाने के लिए योग और ध्यान भी पाए गए [8]। कुंडलिनी योग संज्ञानात्मक व्यवहार चिकित्सा के लिए मानार्थ पाया गया था जिसने राज्य और लक्षण चिंता, अवसाद, आतंक, नींद और जीवन की गुणवत्ता में काफी सुधार किया [9]। हार्वर्ड के अलावा, लॉस एंजिल्स में कैलिफोर्निया विश्वविद्यालय के वैज्ञानिकों ने भी योग के पीछे जीवविज्ञान की जांच शुरू कर दी। नोबेल पुरस्कार विजेता एलिजाबेथ ब्लैकबर्न ने पाया कि आठ सप्ताह के लिए कम से कम 12 मिनट प्रति दिन योग और ध्यान 43% तक दूरबीन गतिविधि को बढ़ाकर तनावग्रस्त उम्र बढ़ने में सुधार कर सकता है। इसके अलावा, बोस्टन यूनिवर्सिटी स्कूल ऑफ मेडिसिन के वैज्ञानिकों ने बताया कि तंत्र तंत्रिका तंत्र को विनियमित करके और योनि टोन में वृद्धि करके शरीर की क्षमता को सफलतापूर्वक प्रतिक्रिया देने की क्षमता का काम करता है। बिल्डरबेक एट अला। पाया गया कि योग और ध्यान अभ्यास यूके में जेल की आबादी में कथित तनाव को कम करने और मनोदशा में सुधार करने में सहायक थे [10] हालांकि, हर्नान्डेज़ एट अला। पाया गया कि ध्यानदाताओं के एक समूह ने अपेक्षाकृत कम मस्तिष्क कोर्टेक्स पर मानसिक चुप्पी की स्थिति को गहरा बनाने के साथ मस्तिष्क सक्रियण संयोग को अपेक्षाकृत कम किया, शायद इस राज्य से जुड़े ध्यान संबंधी चिंतन की एक सहज प्रक्रिया को दर्शाता है [11]।

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