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#Let's Create Atmanirbhar Bharat Together

Announcement

A **Special Number of the University News** on the theme **'Digital Transformation in Higher Education'** is being brought out in the month of October, 2023 on the occasion of South Zone Vice Chancellors' Meet–2023-24 which is scheduled to be held on **October 26-27, 2023 at Visvesvaraya Technological University, Belagavi, Karnataka**. The **Special Issue** will cover articles by eminent educationists and policymakers. Readers of the University News are also invited to contribute to the Special Number by submitting papers/articles on the above theme by **October 10, 2023**. The papers will be published in the Issue subject to fulfillment of AIU Norms for publication as given on the AIU Website and on the approval of the Editorial Committee of the University News. The Subthemes for the Special Issue are:

- *The Future of Credentialling: Digital badges, Micro-Credentialing and Online Degree.*
- *AI and Analytics in Higher Education: Transforming Decision Making.*
- *Faculty Development & Digital Pedagogies: Empowering Educators.*

Interested Scholars may contribute articles by stipulated date keeping in view the following guidelines for contribution:

Articles submitted for the Journal should be original contributions and should not be under consideration for any other publication at the same time. A declaration is to be made by the author in the cover letter that the paper is original and has not been published or submitted for publication elsewhere.

Manuscripts including tables, figures, and references should be around 3000-4000 words for articles, 2000 – 5000 words for Convocation Addresses, 1000 words for Book Reviews, and 600 words for Communications. All the manuscripts should be typed in double-space with 12-point font and ample margin on all sides on A 4-size paper.

The cover page should contain the title of the paper, author's name, designation, official address, address for correspondence, contact numbers, and e-mail address.

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- Miles, M., & Huberman, M., (1994). *Qualitative Data Analysis*. London: Sage.

Articles

- Over, R. (1982). Does research productivity decline with age? *Higher Education* 11: 511-20.

Chapter in a Book

- Rendel, M. (1986). How many women academics 1912-1977? In R. Deem(ed.), *Schooling for Women's Work*. London: Routledge.

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The Editor is free to make editorial corrections in the content as well as the title of the article and change the title in accordance with the content of the article as well as the overall theme of the Issue.

The maximum time taken for processing the article is six months. Contributors are free to send the material to any other publication after a period of six months from the date of their submitting the article to the University News if they do not receive any intimation from AIU.

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In This Issue

Finding Gandhi in the National Education Policy─2020

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A few years back, for a young person who is deeply interested in the philosophies of education, Gandhian thoughts and perspectives don't come very naturally in mind but he does make some occasional appearances every now and then. Gandhi was known differently in different circles. He was a leader, a preacher but most importantly an educator and a practitioner. Despite the passage of time and age, Gandhi's worldview on education and what it meant to the world today is always going to be a significant question. The launch of the much-acclaimed National Education Policy (NEP–2020 has yet again given us a brilliant opportunity to find traces of Gandhi in the everyday realities of education in India.

Learning Transcends Education

For Gandhi, education was incomplete without the element of learning. For him, a person was made of three constituents, *the body, the mind, and the spirit.* Gandhi believed that the education system gave primacy to the mind and kept the body and spirit somewhere at the backburner. NEP–2020 after almost three decades of wait has exhibited a similar shift in philosophy wherein it holds that education in its primitive form of rote learning does not lead to the expected outcomes of human development. In order to alter this reality, the NEP has put this kind of education on a backseat and has given prominence to the idea of learning that is *holistic, integrated, inclusive, enjoyable, and engaging (Section 4).*

A very interesting idea of *learning how to learn* has also been coined in the NEP- 2020. Operationally, this will be made possible through a series of curricular and pedagogy reforms. For Gandhi too, the knowledge which is imparted through our education system mainly caters to the mind and hardly the body and the spirit. He was in fact a little unsure about the wholesome development of the mind too because the education system mostly bombards students with information that has no direct and obvious applications in their everyday lives and practices. As an awkward truth, it still very much holds true for the current Indian education system. To corroborate this with Gandhi's own words, *"My experience has proved to my satisfaction that literary training by itself adds not an inch to one's moral height and that character-building is independent of literary training. I am firmly of opinion that the Government schools have unmanned us, rendered us helpless and godless. They have filled us with discontent, and providing no remedy for the discontent, have made us despondent. They have*

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made us what we were intended to become, clerks and interpreters." (Gandhi, 1921).

New Avatars of Nayi Talim

Any conversation around Gandhi and Education is incomplete without the mentioning of *Nayi Talim* who believed in Education for life, through life and throughout life. The idea of learning transcends mere education grounds itself in this theory and emphasizes greatly the synthesis between vocation and education, a feature which has come out very prominently in the NEP- 2020. Words like '*behavior*', '*ethics*', '*hygiene/cleanliness*', '*cooperation*' in fact have a surreal resemblance to Gandhi's vision of education.

A clear and explicit emphasis has been given to making vocational crafts, arts, physical education, etc. an intimate component of regular classroom teaching. For Gandhi, skill training and vocational education were important as it made a student self-reliant and capable of leading her life independently. He believed that this kind of education is self-serving, sustainable, and long-lasting. Gandhi spoke about skills like handicraft, agriculture, cattle rearing, etc. which might not be totally relevant to today's context but it certainly offers viable and more contemporary alternatives like digital skilling, hand-crafts, etc. To make this possible, the most crucial would be the role of teachers who are not just the enablers but are also co-learners in this process. Gandhi emphasized that *students must cease to be mere imitators* but instead should be brave and bold to have meaningful dialogues with their instructors to create a more engaging learning environment, something which has clearly been the priority of the NEP-2020.

Inclusion Equity and Gandhi

A very important aspect of Gandhian conception of education is a deeper understanding of how he viewed inequity and discrimination which was connected to the bigger politics of knowledge. Gandhi was always a proponent of Knowledge Democracy and advocated for knowledge to be owned, viewed and disseminated by everybody. This idea of knowledge equity has slowly and steadily taken shape in different National Education Policies in India and finds itself somewhere in the bigger vocabulary of *The Socially and Economically Disadvantaged Groups (SEDGs)* in the present NEP. Gandhi's advocacy for equity and inclusion in Education was also directed at marginalized communities including people with no literacy, women, untouchables, caste minorities as well as other disadvantaged groups. In addition to giving equal access to education to these marginalized groups, Gandhi also offered a powerful idea of '*lok-vidya*' or the knowledge of the people which finds a faint recognition in the NEP-2020. What needs to be understood here is that Lokvidya is much more than just traditional knowledge and represents more inclusive lifestyles and working knowledge systems.

It also refers to dynamic vocational knowledge that exists in society in various forms (Basole, 2014). Through the proposition of this idea, Gandhi exhibited unique ways of seeing, understanding and changing the world.

Gandhi's life and principles have repeatedly resonated with the importance of local knowledge and local wisdom. A very crucial tool for exploring this local wisdom is through the means of language, something that Gandhi passionately talked about throughout his life. Coming from a time when we were slaves not just to colonial emperors but also to colonial ideas of education, Gandhi vehemently opposed the idea of English as the medium of instruction and learning. Almost a century later (Hind Swaraj was published in 1908); we as a civilization find ourselves battling with the same ideas and philosophies. The NEP- 2020 has a well-detailed section on how multilingualism, especially the inclusion of mother tongue, is crucial to the process of learning and how the earlier a child is exposed to their native languages, the better they become at relating their realities to that of the culture and the world around them. While the subtle insistence on learning Hindi as a language of majority and national unity can be traced in both these journeys, it is rather fascinating to see how the prophecies of such old times still hold grit in this dynamic context. Gandhi in some sense was truly ahead of his times. To substantiate,

"There never was a greater superstition than that a particular language can be incapable of expansion or expressing abstruse or scientific ideas. A language is an exact reflection of the character and growth of its speakers. Among the many evils of foreign rule, this blighting imposition of a foreign medium upon the youth of the country will be counted by history as one of the greatest. It has sapped the energy of

the nation, it has shortened the lives of the pupils, it has estranged them from the masses, it has made education unnecessarily expensive. If this process is still persisted in, it bids fair to rob the nation of its soul. The sooner therefore educated India shakes itself free from the hypnotic spell of the foreign medium, the better it would be for them and the people."

Lastly, the idea of equity and inclusion cannot be seen in isolation and has to be contextualized in the bigger imagination of communities. Gandhi believed that the education system should be intricately tied to the idea of social service. Serving the communities and serving the underprivileged sections of society should be an integral part of learning from the early stages of schooling. Such ideas and practices will lead to educating the mind and the spirit and will also generate a sense of active citizenship, empathy and inclusion among children. The idea of active citizenship was also related to understanding one's rights, duties and obligations as the members of the community. While Gandhi's conception represented a time dominated by a rural-centric lifestyle, it can still be viewed in parlance as rural-urban inequities that exist today. This idea of community participation has also been reflected in the principles as well in multiple other sections of the NEP- 2020. In fact, just like Gandhian imagination, the NEP also envisions an active local and decentralized involvement of communities and other stakeholders in managing the day-to-day operations of schools in India.

Conclusion

It is important to clarify here that this article is no blind adulation of either Gandhi or his philosophies of education. It is well acknowledged that some of Gandhi's ideas around education (e.g. the overt nationalism, idealism, insistence on the majority and their choices, making religion as the basis/guide to meaningful education, etc.) have their own range of criticism and debate but it needs to be repeated that Gandhi lived and preached in a highly transformative period for India. It was a time when the economy was at a downfall, the masses were highly uneducated, political instabilities existed and the county was walking on many other tightropes. What Gandhi did for us was to give the preliminary ideas to build the nation which was the need of the time. He was right in believing that Education is going to be the first step towards our prosperity and self-sustenance and it is the steady prolongation of policies like the National Education Policies that re-affirms those beliefs.

India is now an independent country but is also a country undergoing some really tough times. The pandemic has taken the country by surprise, the economy is extremely volatile, the reducing rural-urban divide has led to its own set of adjustments and challenges, the population of young but unemployed youth is on a constant rise, and the democracy and freedom of free speech/thought is undeniably under threat. At the outset, it might appear that Gandhi has become obsolete in this context but on the contrary, Gandhi has never been more relevant as he is today. It is time for us to acknowledge each other's diversities and identities and take a more peaceful, non-violent and inclusive approach in understanding each other's life struggles and demands. The only way to begin this conversation would be through the means of Education (not just institutional but also through popular education). It is only then that we will be able to prepare a more sensitive, unbiased and confident generation of learners who will be ready to embark on a meaningful economic and social life as an adult. Until that happens, Gandhiji's dreams of swaraj will not be fulfilled. ❑

Thoughts of Mahatma Gandhi with Relevance to Value Education

Farzana Munawwar*

Indian education has always been value-based and one of the teacher's responsibilities is to deal with moral and ethical dilemmas. The social, intellectual, and political progress and harmony of the globe today depend greatly on education and most importantly, value education. Parents, communities, and the government have long expected schools to turn out citizens who will make a positive contribution to the society in which they live. For imparting value-based education, storytelling, exhibits, skits, one-act plays, group discussions, and other formats are all effective teaching techniques. Understanding how teachers' duties are changing in the digital era is very exciting in this context. Students today expect teachers to be technologically savvy, computer literate and educated to the greatest standards, which implies that the teachers' responsibilities have significantly grown.

The social institution of education is essential for the development, prosperity, and peace of humanity. The main objective of Indian education is to lead people from illusion to reality, from darkness to light, and from this world to eternal life. Everybody is born without prejudice and without any preconceived ideas like a clean slate. A moral-based educational system is necessary for people to develop ethically. Values raise the standard of living. Human life and values are closely intertwined. They are intertwined with the daily activities we engage in. Since learning and teaching are ongoing processes that continue until we take our final breath, education is a dynamic and innovative experience that we undergo throughout our lives. An individual's personality is enhanced by education, which provides guidance for making efforts to turn one's dreams into realities and improves a person's multiple dimensions at the cognitive, affective, and psychomotor levels to increase one's competence on all fronts—physically, emotionally, mentally, and skillfully. In order to promote moral and social values in society, education must be used as the main vehicle, according to the National Policy on Education (NPE), which was formed in 1986. The Programme of Action (1992) included ten key principles in the school curricula while also emphasizing value-based education. Values are frequently long-term standards or guidelines that are used to assess the worth of a viewpoint or course of action. As stated in the dictionary, value means "to prize, to esteem, to appraise, or to estimate." It alludes to the act of holding something dearly and cherishing it, as well as the act of evaluating the kinds and quantities of values in relation to other things. According to the National Curriculum Framework, "Education for peace attempts to encourage ethical development, inculcating the values, attitudes, and skills necessary for living in harmony with oneself, others, and nature." The main objectives of value-based education are "Man Making" and "Character Building." It is the process by which people teach others about their ideals.

Given the evolving social norms and expectations in today's multiracial and multicultural world, it could be difficult for a young student to decide what is ethically right. The importance of putting human values first in this globalised period cannot be overstated. Value-based education is a contentious issue in India's diversified educational system. Therefore, value orientation will obviously be the main objective of the education. The goal of education should be to spread timeless, universal principles that will help our culturally varied community come together and integrate. Teachers' jobs become more demanding in this context. teachers can play a crucial role in ensuring that the impact of value education is maintained. They can also ensure that students open the right doors and aid in the development of their personalities, which is important in any career path they may choose.

Review of Related Literature

According to Anubhav Singh (2016), the primary issues that each educational level in India must deal with are quality and relevance. When it comes to meeting the demands of a youthful and growing labour force, India has enormous challenges. Numerous demands, including those

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for skilled teachers, pertinent curricula, financial aid for students, and suitable facilities, must be addressed by the Indian education sector. Additional challenges arise from the inability to meet the diverse linguistic, cultural, regional, and municipal educational needs of such a vast nation. Donors should consider the environment in which they will be investing their philanthropic donations, as well as social rewards and future growth opportunities. Due to recent changes in Indian regulations, this is a particularly excellent time for businesses to promote the expansion of India's educational system.

Pushpanathan (2013) argues that Value Education tries to positively change students' attitudes and methods so they can better address some of the fundamental questions they ask themselves. The values-clarification process will enable them to live by conviction rather than convenience. They can become more aware of themselves and others, which will enhance their connections and responses, by becoming aware of their own values, attitudes, wants, and true selves. According to research, the groundwork for both independent and well-coordinated group action is laid when one kid develops a feeling of direction and purpose. They'll be able to make choices that benefit society as a whole as well as their own personal growth.

The National Education Policy of 2020

Education is the highway leading to the solution of all our problems. From time-to-time education policies were launched in India to give direction and purpose to education, methods of attaining them, and measuring the success of the education system. In this era, we see many people are jobless all over the world due to the insufficiency and inadequacy of formal education and skill training. Also, due to the advancement of machine learning and artificial intelligence, there is a lack of skilled personnel for catering to various purposes. To fulfill this demand, there is an urgent need to transform education and make it digitalised and multidisciplinary to make people skilful so that they can compete in this era. Recently, the Union Cabinet has approved the new National Education Policy (NEP–), 2020 which is the first education policy of the 21st century. It has recommended several changes in the Indian education system - from the school to the college level. The NEP–2020 aims to make "India a global knowledge superpower". It is a milestone document for bringing transformation in education after a long period of 34 years.

According to this, the curriculum must include basic arts, crafts, humanities, games, sports and fitness, languages, literature, culture, and values, in addition to science and mathematics, to develop all aspects and capabilities of learners; and make education more well-rounded, useful, and fulfilling to the learner.

The greatest national leader, preacher, educator, implementer, and contributor in the sphere of education is Mahatma Gandhi. He exerted numerous attempts to reform the educational system, working both directly and indirectly in every area of education. The basic education plan (Wardha Scheme), also known as *Nai Talim* or *Buniyadi Talim*, was presented by Mahatma Gandhi, the Father of the Nation, in 1937 for modern India. This plan can be regarded as the first blueprint for a national system of education that is job-centered, craft-centered, value-based, mass-oriented, self-supporting, and self-sufficient. His idea of vocational education was a light bearer for the education system. NEP–2020 beholds some of his educational thoughts.

Educational Thoughts of Mahatma Gandhi

Gandhi Ji advocated free and compulsory universal primary education for children between the ages of 7 to 14 and NEP 2020 also recommended free and compulsory education from 3 to 18 years. Free and compulsory education is necessary to increase the literacy rate of the country and bring children into the mainstream of education. Gandhi's Basic Education had three broad components-Pre-basic (up to 6 years), Basic (7 to 14 years), and Post - Basic education (after 14 to 18 years). According to the timeline of basic education also known as New Education or Nai Talim, pre-basic education starts prior to the age of seven, and post-basic education begins after the age of 14. This timeline corresponds to the timeline of NEP 5+3+3+4 broadly (3-8, 8-11, 11-14, and 14-18 years respectively). Basic education advocated pre–education up to 6 years and NEP also recommended for pre–education/*Aganwari* from 3 to 6 years of children in their preparatory stage of education as they recognized this stage as the crucial stage for the development of the mental faculties of a child.

Mahatma Gandhi placed a clear and explicit emphasis on making vocational crafts, arts, physical education, etc. an intimate component of regular classroom teaching. According to Gandhi Ji, skill training and vocational education are important as they make a student self-reliant and capable of leading life independently. He believed that this kind of education is self-serving, sustainable, and long-lasting. Also, according to the National Education Policy–2020 report, MHRD mentions on page 16 that "Every student will take a fun course, during Grades 6-8, that gives a survey and hands-on experience of a sampling of important vocational crafts, such as carpentry, electric work, metal work, gardening, pottery making, etc., as decided by States and local communities and as mapped by local skilling needs. A practice-based curriculum for Grades 6-8 will be appropriately designed by NCERT while framing the NCFSE 2020-21." In this way, both gave stress to vocational education. Mahatma Gandhi wanted to attach all children to the education system, so he gave ideas of '*Lok-vidya'* and education for all, irrespective of caste and creed. He emphasized the idea that education should be accessible to every individual as it is very necessary for our democratic country). He mainly focussed on including the vulnerable and marginalized groups which include women, untouchables, and other socially and culturally disadvantaged groups into the mainstream of Education by providing them with equal access to education and other educational opportunities that their more privileged counterparts in the society enjoyed. Also, in the present NEP–2020, his views were taken into consideration in the bigger domain of the Socially and Economically Disadvantaged Groups (SEDGs). NEP–2020 stresses values education which is similar to Gandhi's emphasis on character building. Good character can be built by adopting good values. Gandhiji had full faith and respect for Indian values, which is why he wanted to introduce them to education. New Education Policy 2020 also has the provision of value-based education. According to Gandhiji "The end of all knowledge must be the building of character. What is education without character and what is character without elementary personal purity" (M.K. Gandhi, 1962). Gandhiji emphasised the building of qualities of truthfulness, non-violence, celibacy, tastelessness, non-stealing, non-hoarding, and fearlessness in all children. His aim of education was also to create a classless society based upon love, truth, justice, equality, brotherhood, cooperation, and national solidarity. As mentioned in NEP 2020 report MHRD, "Students will be taught at a young age the importance of "doing what's right", and will be given a logical framework for making ethical decisions. In later years, this would then be expanded along themes of cheating, violence, plagiarism, littering, tolerance, equality, empathy, etc., with a view to enabling children to embrace moral/ethical values in conducting their life, formulate a position/argument about an ethical issue from multiple perspectives, and use ethical practices in all work. As consequences of such basic ethical reasoning, traditional Indian values and all basic human and Constitutional values (such as *seva, ahimsa, swachchhata, satya, nishkam karma, shanti,* sacrifice, tolerance, diversity, pluralism, righteous conduct, gender sensitivity, respect for elders, respect for all people and their inherent capabilities regardless of background, respect for environment, helpfulness, courtesy, patience, forgiveness, empathy, compassion, patriotism, democratic outlook, integrity, responsibility, justice, liberty, equality, and fraternity) will be developed in all students.

The Impact

The idea that a child is born with values and that teachers must discover them should be instilled in the minds of student-teachers by teacher educators. In order to impact pupils, education should enlighten them about the national social ethos and the principles of life. The search for educational resources should be left to the initiative and inspiration of the teachers rather than being constrained by textbook content. Teachers should instil knowledge and moral principles in their students and foster an environment conducive to friendship among teachers and teacher educators.

While it is impossible to teach values in isolation, teachers can give students opportunities to think about and reflect on values while also putting their contemplation into practice. Teachers must consider the values that undergird scientific endeavours and attempt to prepare curricula and methods that reflect these values. At present, the edifice of faith, trust, fellow feeling, loyalty, mutual help, fair play, sacrifice, and obedience to the law, are crumbling rapidly under the weight of materialism. The practice of the values by the teacher is more important than mere inclusion in the syllabus.

Teacher educators must develop competencies in teacher trainees to teach on the basis of the accepted principles of teaching and learning.

A teacher is considered as a fountain of all knowledge and a source of great ideals. S/he is the torch-bearer to society. Hence if the teacher has a keen sense of values and has faith in the higher purpose of life, s/he can guide the whole generation through his versatile personality. Stories and examples can be used to explain moral principles. Playing out a good narrative in class. Poems, novels, and stories can help us teach students moral principles. It is important to cultivate human values in kids for the benefit of their bodies and minds.

Therefore, a process of cultivating the spirit of logical inquiry and self-discovery should be a part of value-based education. When the teacher serves as an example and makes sure that value-based education is at the core of the school's ideology, value-based education is most effective. Regarding everyone's race, gender, marital status, political or religious beliefs, family, social, or cultural background, sexual orientation, or socioeconomic status, teachers shall act impartially and without prejudice. Value-oriented learning objectives should guide the lesson's content. Through the use of supplemental readers and a language book that has been carefully produced, all the principles can be ingrained and instilled. A child's positive human values can be brought forth with tender care and loving attention. Teachers should be able to look at school subjects holistically and with a broader perspective thanks to their training, rather than just as a collection of uninteresting information. In education, values ought to come first. Realising the importance of values in character development. Students who have strong morals and socioemotional skills will excel in any career.

Conclusion

Education is our human right and important for changing the behaviour of the students. It is an essential and crucial element for the all-round development of any society and country. So, many educational thinkers gave their thoughts related to different aspects of education such as the aim of education, curriculum framing, method of teaching, teacher role and students, etc. In India, different education policies are made by taking the thoughts of different educational thinkers. M.K. Gandhi is an eminent educational thinker whose educational thoughts are valuable for our social system.

It would seem that moral and ethical concerns, particularly character education, have a significant need to be included in teacher education programmes. A thorough plan of value-based education for teachers can be found in the professional ethics for teachers. To conclude further, teachers can be the key role players in accelerating the impact of value education and making sure that students open the right doors and help in the development of their personality which plays a crucial role in any field they may choose to go in. The subject knowledge is important but having morals and values makes everything better, the person, the profession, and the society.

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Millets in Service of Food and Nutrition Security and Environmental Sustainability

N P Melkania*, Shiv Shankar and Asha Pandey*****

Millets are resilient, pharmaceutical-nutritional species that can offer a cost-effective and nutrient-dense alternative, as well as assist in ensuring food security and environmental sustainability. They also have a strong foundation in the customs and culture of indigenous people. The United Nations General Assembly at its 75th session in March 2021 declared 2023 as the International Year of Millets (IYM 2023) with the Food and Agriculture Organization of the United Nations (FAO) as the lead agency. Millets encompass a diverse group of cereals including pearl millet, proso millet, foxtail millet, barnyard millet, kodo millet, brown top millet, finger millet, and Guinea millet, as well as fonio, sorghum (or great millet) and teff. Millets are currently grown all over the world, having been a traditional food source for tens of billions of people across Sub-Saharan Asia and Africa (especially the countries of China, India, and Nigeria) for over 7000 years. Millets have alarmingly high potential to combat climate change and provide food security, but their production is falling in many nations. These underutilized and neglected crops might be a key component of a resilient food supply chain and one of the answers for a climate that is robust in the face of a worsening climate catastrophe and numerous environmental challenges. While describing the nutritional value and environmental uniqueness, this article highlights the importance of millets as resilient food and their role in the promotion of food security and environmental sustainability.

Resilient grain crops-the millets, offer an economic and nutrient-dense staple food and pharma to feed a growing global population. Along with fonio *(Digitariaexilis*), sorghum (or big millet), and teff (*Eragrostis tef*), the small millets include foxtail, barnyard, pearl, proso, kodo, browntop (*Urochloaramosa*), finger, and Guinea (*Brachiariadeflexa*). For millions of inhabitants in the African continent and Asia, these species are a significant source of food from rainfed and stress-affected conditions, and contribute as culturally-appropriate crops, firmly ingrained in the traditions of indigenous peoples especially. Millets in the Anthropocene age, are revolutionizing the agrifood systems, achieving sustainable development, ending hunger, and empowering smallholder farmers and marginalized and least attended humans.

According to an estimate (United Nations, 2023)**,** millets are an essential part of the diet of over 90 million individuals in Asia and Africa. Africa produces more than 55 percent of the world's output of millets, with Asia coming in second (about 40 percent). Europe contributes about three percent of the worldwide market (United Nations, 2023). To feed a population that is expected to exceed 8.5 billion by 2030, and a stunning 9.7 billion by 2050, the global community must produce more food. With the climate issue becoming further worsen, and environmental stressors getting worse too, there is a greater need for crop diversity through supporting crops that can be grown in the harshest of situations. Recognized for high protein, fiber content, resistant starch content, and low glycaemic index, millets are rich in vitamins and minerals, such as iron and calcium.

Millets are ancient crops and have been in cultivation for thousands of years. For example, finger millet was domesticated 5000 years ago in Africa (Antony Ceasar and Maharajan, 2022); pearl millet 4000 years ago (Taylor, 2018); and foxtail millet 8000 years ago (Pramitha *et al.,* 2023). Rich mineral nutrients and enduring health benefits have attracted consumers in recent years for consuming millet (Sharma *et al.,* 2021).As they have generally been left off the worldwide food safety agenda, their output has progressively decreased in recent years. The

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Food and Agriculture Organization (FAO) supported India's suggestion in 2018 put forward to observe the Year 2023 as the International Year of Millets which was officially declared by the United Nations General Assembly at its 75th Session in March 2021 (Rao *et al.,* 2021). The resolution designating the year 2023 as the International Year of Millets looks forward to support from all global parties involved in "activities with the goal of increasing consciousness and guiding policy attention to the dietary and health advantages of millet intake, and appropriateness of millets for growing under unfavourable and shifting climates, while also directing policy attention to enhance value chain efficiencies.

Broad Category of Millets

Millets are very varied round shaped, small-seeded graminaceous species that can be yellow, white, green, or red in colour (Fig.1 and 2).These are included in two categories, as follows:

Fig. 1 A-E: An Illustration of Millets of Major Significance

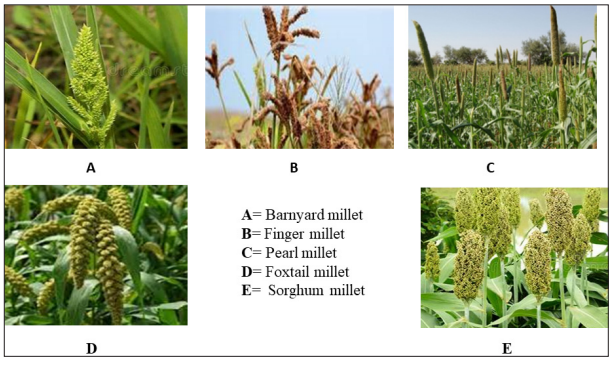

Fig. 2 Grains of prominent popularly consumed millet species (Sources are identified above with each millet crops)

Naked Grain Millets

Bajra, Ragi, Jowar are examples of naked grain millets since they are free of the abrasive, non-edible husk. After harvest, these millets do not need post-harvest processing. After cleaning simply, one can immediately eat them. As a result, these millets are now heavily farmed (Nimbkar*et al.,* 2022).

Husked Grain Millets

These includes millets like *Kodo*, *Foxtail,* and Little. These species have non-edible seed coat that need to be removed before eating. The millets once processed manually (mechanical processing) are mostly used as rice crops.

Popularly Consumed Millets

Millets consumed popularly around the world (Fig. A to H) are listed below:

Finger Millet

This cereal crop, often referred to as *ragi* or *Mandua* is a nutritious substitute for wheat and rice (Chandra *et al.,* 2016). Having the highest amount of calcium among all cereal crops, it supports growing children's bones. Therefore, it must be included in the diet of pregnant women especially. Additionally, *ragi* use may shield against bone conditions like osteoporosis. Benefits of finger millet, particularly green ragi include Prevention of liver damage and regulation of blood sugar levels, especially in diabetics, and promoting milk production in lactating women, particularly in breast feeding to child.

Foxtail Millet

Sometimes referred to as *kakum* or *Kangni,* like all millets, it is nutrient-dense, especially in Vitamin B12 that helps in keeping blood and nerve cells healthy, and reduces megaloblastic anaemia- a rare blood disorder that makes one feel weak and exhausted. Additionally, rich in iron and calcium, the foxtail millet aids in reducing and managing muscle spasms. The amino acids available in it, lower "bad cholesterol" levels, thus, protecting humans against serious heart ailments (Pramitha *et al.,* 2023).

Sorghum Millet

Referred to as *Jowar* locally, it contains policosanol. Organic *jowar* lowers cholesterol levels, and is a good source of iron, protein, and fiber. *Jowar* is a better option for those who have a wheat allergy. In addition of being high in calories and macronutrients, *jowar* also contains more antioxidants than blueberry and pomegranate.

Pearl Millet

Known as *Bajra* locally, is the most widely consumed grain grown on the Indian and African sub-continents. It is used in many Indian homes to prepare basic dishes like *khichdi*, *roti*, *etc.* This millet prevents acid reflux and stomach ulcers. It can also help those who are struggling with type 2 diabetes.

Little Millet

It is known by different names depending on where it is grown, including *moraiyo, kutki, sama*, and *shavan*. It has substances like phenols, which are popularly known as antioxidants, and tannins, which help regulate immune responses and decrease blood pressure. Additionally, the shelf life of this grain is endless.

Barnyard Millet

Named as *Sanwa* or *Jhangora* locally, it is rich in nutrients, mostly dietary fiber. Humans' digestive systems requires dietary fibers to function properly. It has low glycemic index, which indicates that it has a comparatively low carbohydrate content, and is slowly absorbed. Those who have diabetes, can benefit from eating barnyard millet.

Broomcorn Millet

Broomcorn millet (Proso millet) has a low glycemic index, like the majority of millets, and helps people with type 2 diabetes control their blood sugar levels. Additionally, it includes vital amino acids that aid in tissue regeneration and nutrient absorption. However, Proso millet is a well-liked bird food.

Kodo Millet

The high nutritious content of lecithin amino acids in kodo millet is well known for improving memory and retention. It has also high B vitamins, particularly niacin and folic acid, like Foxtail and Sorghum millets.

Global Production of Millets

As much as 97 percent of millets are produced in developing nations, where it is a significant crop in the semi-arid tropics of Asia and Africa, particularly in India, Mali, Nigeria, and Niger. Africa produces more than 49 percent of the world's output, with Asia coming in second (24.9 per cent) with over 40 percent (Table1). Only 2.3 percent of the global market is located in Europe. India produces 173 lakh tonnes; 80.5 percent Asia's & 20.04 percent of global production. The global average yield is recorded 12.29 q/ha, while for India, it is recorded as 12.39 q/ha (FAO,2023).

Millets as a Key Food Commodity: Why?

Millets Are There When Others Are Not

The increasing world population requires enough quality food in the midst of climate issues and the decline of natural resources. Millets may contribute to the solution as they can withstand extreme weather and stress. Millets are a vital food source for people facing the threat of food insecurity since they are typically among the only food crops that can be grown during dry seasons, and in stress-rich rainfed environments.

Millets Contribute to a Healthy Diet

Minerals, protein, and antioxidants are all present in millets (Hassan *et al.,* 2021). Each form of millet is a complete grain that contains various kind and amount of fiber, which helps to control bowel movements, blood sugar levels, and cholesterol levels. Additionally, millets have a low glycaemic

Table 1 Global Status of Millets: Area and Production Region-wise (PIB, 2022)

Region	Area Under Millet Cultivation		Millet Production	
	Area Lakh/ha	%*	Lakh tonnes	%*
Africa	489	68.1	423	49.0
America	53	7.4	193	22.4
Asia	162	22.6	215	24.9
Europe	8	1.1	20	2.3
Australia & New Zealand	6	0.8	12	1.4
India	*138*	*19.2*	*173*	*20*
World	*718*		*863*	*49*

**Percent of the world*

index and are gluten-free, making them fantastic meal choice for anyone and everyone who faces diabetes, hypertension, or celiac disease. They can offer iron at a reasonable price. The nutritional value of millets is enumerated in Tables 2,3 and 4.

Table 2. Millets-The nutritional profile per 100 g (Source: ICAR-IIMR, Hyderabad)

Millet	**Protein (%)**	**Fat (%)**	**Ash (%)**	**Carbohydrate (%)**	**Total Dietary Fiber (%) (TDF)**	**Energy (Kcal)**
Sorghum (*Jowar*) *Sorghum bicolor*	9.9	1.7	1.4	**67.7**	10.2	334
Pearl millet (*Bajra*) *Pennisetum glaucum*	11.0	5.4	1.3	61.8	11.5	347
Finger millet *(Ragi/Madua) Eleusine coracana*	7.1	1.9	2.0	66.8	11.2	320
Foxtaill millet (*Kauni Setariaetalica*	12.3	4.3	2.6	60.1	10.7	331
Kodo millet (*Kodon*) *Paspalum scrobiculatum*	8.9	2.5	1.7	66.2	6.4	331
Proso millet (*Barre*) *Panicum miliaceum*	11.5	3.5	2.7	64.5	9.6	341
Barnyard millet (*Jhongra/Madira*) *Echinochloa frumentacea*	6.2	2.2	1.3	65.5	12.6	307
Little millet (*Kutki*) *Panicum sumatrense*	10.3	3.9	1.3	65.5	7.7	346
MAJOR CEREALS						
Cereal	**Protein (%)**	**Fat (%)**	**Ash (%)**	**Carbohydrate (%)**	**Total Dietary Fiber % (TDF)**	**Energy (Kcal)**
Rice, (Raw, milled)	11.0	5.4	1.4	61.8	11.5	347
Wheat (Whole grain)	10.6	1.4	1.4	64.7	11.2	321
Maize (Dry)	8.8	3.7	1.1	64.7	12.2	334

Table 3. Millets-Important minerals/100 g (Source: ICAR-IIMR, Hyderabad)

Millet	**Ca (mg)**	**P (mg)**	**Mg (mg)**	**Zn (mg)**	**Fe (mg)**
Sorghum	27.6	274	133	1.9	3.9
Pearl Millet	27.4	289	124	2.8	**6.4**
Finger Millet	**364.0**	210	146	2.5	4.6
Foxtail Millet	31.0	**290**	81	2.4	2.8
Kodo Millet	15.3	101	122	1.6	2.3
Proso Millet	30.0		**153**	1.4	2.0
Barnyard Millet	20.0	280	82	**3.3**	5.0
Little Millet	16.1	130	91	1.8	1.3

MAJOR CEREALS

Cereal	**Ca (mg)**	**P (mg)**	**Mg (mg)**	**Zn (mg)**	**Fe (mg)**
Rice (Raw, milled)	7.5	96	19	1.2	0.6
Wheat (Whole grain)	39.4	315	125	2.8	3.9
Maize (Dry)	8.9	279	145	2.3	2.5

Table 4. Millets- Important B-vitamins/100 g (Source: ICAR-IIMR, Hyderabad)

Millet	Thiamine (mg)	Riboflavin (mg)	Niacin (mg)	Folic Acid (µg)
Sorghum	0.35	0.14	2.1	39.4
Pearl Millet	0.25	0.20	0.9	36.1
Finger Millet	0.37	0.17	1.3	34.7
Foxtail Millet	0.59	0.11	3.2	15.0
Kodo Millet	0.29	0.20	1.5	39.5
Proso Millet	0.41	0.28	4.5	-
Barnyard Millet	0.33	0.10	4.2	-
Little Millet	0.26	0.05	1.3	36.2

Contd. MAJOR CEREALS

Cereal	Thiamine (mg)	Riboflavin (mg)	Niacin (mg)	Folic Acid (µg)
Rice	0.05	0.05	1.7	9.3
Wheat	0.46	0.15	2.7	30.1
Maize	0.33	0.09	2.7	25.8

Millets Offer Promising Livelihood Opportunities for Small-Holding Farmers

Dietary tastes have changed as alternative grains have proliferated, which has caused a drop in millets' production and demand. However, the millet's market share can be reclaimed and open up new prospects for small-holding farmers by promoting the use and production of these overlooked crops.

Millets' Trade Can Improve the Diversity of the Global Food System

Less than three percent of the world's grains commerce is currently made up of millets (FAO, 2023). Millets can be a beneficial substitute for commonly traded grains when sudden shocks impact the foodgrain market. This increased diversification can lessen dependency on other grains, and increase the stability of the international trade markets.

Millets: The Cultivars Development in India

In the post-independence period, the development of high-yielding cultivars and hybrids of sorghum, pearl millet, and small millets led to improvement in the productivity of these orphan crops. In addition to the public sector institutions (Tables 5, 6 and 7), private entrepreneurs and corporates have also contributed significantly to the development of superior hybrids, and commercialization of pearl millet, and grain and forage sorghum. In the case of finger millet, the gain in productivity could be achieved during 1950-60 due to the establishment of the hybridisation technique. Finger millet cultivars CFMV-1 and CFMV-2 are rich in Ca, Fe, and Zn. The little millet variety CCLMV-1 is rich in Fe and Zn. A total of 211 varieties of small millets have been released for cultivation in diverse ecologies and economies of India, with 136 cultivars of finger millet alone (Pathak *et al.,* 2022). The recent initiatives taken by the Government of India for the promotion of millet-centric agriculture are enumerated in Box 1.

Millets for Environmental Sustainability

In order to achieve the UN's Sustainable Development Goals (SDGs), millet farming should be encouraged. "Achieving zero hunger" is one of the SDGS (Goal 2). Ending hunger, achieving food security, enhancing nutrition, and promoting sustainable agriculture are the stated goals of this aim (UN General Assembly, 2015). Millets are generally grown as rainfed crops conventionally with least or no input of fertilizers (Devkota *et al.,* 2016). Interestingly, being less vulnerable to insect attack millets do not require any pesticide (Saxena *et al.,* 2018). Millet seeds, such as finger millet, may be kept in storage for a significant duration without suffering insect damage.

Table 5. Organizations for *Research and Development* Activities *on Millets* in India

Organization	Focus Crop
A. Research Institute	
• ICAR-Vivekananda Parvatiya Krishi Anusandhan Sansthan, Almora 263 601 (Uttarakhand)	Finger millet, Barnyard millet, Foxtail millet
• ICAR-Central Arid Zone Research Institute, Jodhpur, 342 008 (Rajasthan)	Pearl millet
• ICAR-Indian Institute of Millets Research Rajendra Nagar, Hyderabad 500 300 (Telangana**)**	All millets
• ICAR-Central Research Institute for Dryland Agriculture. Santoshnagar, Hyderabad-500 059 (Telangana)	Sorghum, Pearl millet
• International Crop Research Institute for the Semi-Arid Tropics (ICRISAT), Patancheru, Hyderabad 502 324 (Telangana)	Sorghum, Pearl millet
• ICAR-Central Institute of Post-Harvest Engineering and Technology (CIPHET), P.O. PAU, Ludhiana 141 004 (Punjab)	All millets
B. Universities	
• Govind Ballabh Pant University of Agriculture and Technology, Pantnagar 263 145, District U.S. Nagar (Uttarakhand)	Sorghum, Finger millet
• VCSG Uttarakhand University of Horticulture & Forestry, Bharsar 246 123 District - Pauri Garhwal (Uttarakhand)	Finger millet, Barnyard millet, Fox tail millet
• CSK Himachal Pradesh Krishi VishvavidyalayaPalampur 176 062 (Himachal Pradesh)	Finger millet
• Sher-e- Kashmir University of Agricultural Sciences & Technology of Jammu, Jammu 180 009 (Jammu)	Finger millet
• Sher-e- Kashmir University of Agricultural Sciences & Technology of Kashmir, Srinagar 190025 (Kashmir)	Finger Millet
• Sardar Ballabh Bhai Patel University of Agriculture and Technology, Modipurum, Meerut 250 110 (Uttar Pradesh)	Sorghum
• CCS Haryana Agricultural University, Hisar 125 004 (Haryana)	Sorghum, Pearl millet
• Punjab Agricultural University Ludhiana 141004 (Punjab)	Sorghum, Pearl millet
• Agriculture University, Mandor, Jodhpur 342 304 (Rajasthan)	Pearl millet
• Maharana Pratap University of Agriculture & Technology, Udaipur 313 001 (Rajasthan)	Pearl millet
• Swami Keshwanand Rajasthan Agricultural University, Beechwal, Bikaner 334 006 (Rajasthan)	Pearl millet
• Sri Karan Narendra Agriculture University, Jobner 303 329 (Rajasthan)	Pearl millet
• Anand Agricultural University, Anand 388 110 (Gujarat)	Sorghum, Pearl millet
• Mahatma Phule Krishi Vidyapeeth, Rahuri 413 722 Distt. Ahmednagar (Maharashtra)	Sorghum, Pearl millet
• Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola 444 104 (Maharashtra)	Sorghum, Pearl millet
• Acharya N G Ranga Agricultural University, Lam, Guntur 522 034 (Andhra Pradesh)	Sorghum, Pearl millet
• Professor Jayashankar Telangana State Agricultural University, Rajendranagar, Hyderabad 500 030 (Telangana)	Sorghum, Pearl millet
• University of Agricultural Sciences, GKVK Campus, Bangaluru 560 065 (Karnataka)	Sorghum, Pearl millet
• University of Agriculture Sciences, Dharwad 580 005 (Karnataka)	Sorghum, Pearl millet
• Tamil Nadu Agricultural University, Coimbatore 641 003 (Tamil Nadu)	Sorghum, Pearl millet
C. All India Co-ordinated Project	
• ICAR- AIC Sorghum Improvement Project, IIMR, Rajendra Nagar, Hyderabad 500 300 (Telangana)	Sorghum
• ICAR-AICRP on Pearl Millet, Mandor, Jodhpur 342 304 (Rajasthan)	Pearl millet
• ICAR-AICRP on small millets, Project Coordinating Unit, GKVK Campus, Bangaluru 500 065 (Karnataka)	Small millets

Table 6. Stover and Grain yield (q/ha) of recent cultivars of millet crops in India

Cultivar/Hybrid	Grain Yield	Fodder Yield	Area of Adoption
(A)			**Sorghum (Kharif Jowar)**
CSH 30	44	141	South Gujarat, Madhya Pradesh, Maharashtra, North Andhra Pradesh, Karnataka
CSV 20	31	133	All India
CSV 23	20-30	155	All India
CSV 28	28	170	All India
B. Sorghum (Rabi Jowar)			
CSV 22R	23-24	70-72	Medium to deep soils of Andhra Pradesh, Karnataka and Maharashtra
CSV 29 R	25-30	50-75	Medium to deep soils of Andhra Pradesh, Karnataka and Maharashtra Contd.
C. Pearl Millet			
AHB 1269 Fe	32	74	Punjab, Haryana, Delhi, Rajasthan, Gujarat, Maharashtra and Tamil Nadu
Pusa 1201 MH 1849	28	72	Delhi NCR
RHB 223	30	55	Haryana, Rajasthan and Gujarat
D. Finger Millet			
CFMV 3	32	87	Gujarat, Maharashtra, Telangana, Andhra Pradesh, and Tamil Nadu
Vegavathi (VR 929)	36	77	Gujarat, Maharashtra, Odisha, Jharkhand, Telangana, Andhra Pradesh, Karnataka, Tamil Nadu, Puducherry
ML 365	50-55	65	Karnataka
E. Barnyard Millet			
Pratap Sanwa-1	15-17	50-55	Rajasthan
F. Kodo Millet			
CKMV1 (ATL2)	28	70	Gujarat, Madhya Pradesh, Chhattisgarh, Jharkhand, Andhra Pradesh, Telangana, Karnataka, Tamil Nadu
G. Proso Millet			
TNAU 202	19	37	Gujarat, Madhya Pradesh, Chhattisgarh, Bihar, Andhra Pradesh, Karnataka, Tamil Nadu
Pratap Cheena	15-17	48-50	Rajasthan
H. Foxtail Millet			
CO-7	18	51	Tamil Nadu
Pratap Kangani 1	16-18	46-50	Rajasthan
I. Little Millet			
CLMV	16	55	Maharashtra, Andhra Pradesh, Telangana, Tamil Nadu, Puducherry
DHLM-14-1	16	61	Gujarat, Maharashtra, Odisha, Karnataka and Tamil Nadu

Source: Bhat et al., (2023)

Table 7. Popular (Farmers' Preferred) Cultivars of Forage Sorghum in India

Cultivar	SC/MC	GFY	DFY	Area of Adoption
M.P. Chari	SC	300	95	All sorghum growing areas, particularly Central and northern states
Sweet Sudan Grass 59-3	MC	570	138	All forage sorghum growing areas
HC-171	SC	500	160	All India
Punjab Sude Chari 1	SC	218	118	All forage sorghum growing areas in Punjab under irrigation
HC-308	SC	530	175	All India
Pusa Chari-615	MC	700	195	Delhi NCR
Fodder Sorghum Co-31	MC	1920/yr		Tamil Nadu
CSH 43 MF	MC	965	219	Uttarakhand, Punjab, Haryana, Uttar Pradesh, Rajasthan, Gujarat, Maharashtra, Telangana, Karnataka, Tamil Nadu
CSV 46 F	SC	596	163	Uttarakhand, Uttar Pradesh, Haryana, Punjab, Rajasthan, Gujarat
CSV 47 F	SC	430	122	Maharashtra, Karnataka, Tamil Nadu
Source: Aruna *et al.* (2023)				
Abbreviations: SC=Single cut; MC=Multicut; GFY=Green Fodder Yield (q/ha), DFY= Dry Fodder Yield (q/ha)				

In some regions of Africa and India, millets are also used as a dual-purpose crop for food and cattle fodder. Millets are farmed using a minimal input system, particularly on hill slopes and arid/least visited places and barren lands. Pearl millet a highly tolerant crop to elevated temperature and drought, is considered most suitable for changing climates (Saha *et al.,* 2016). The climate resilience characteristic of millets continues to help promote sustainable agriculture without demanding chemical fertilizers (Thilakarathna and Raizada, 2015). Millets can also aid in achieving SDG 13-climate action. The objective and metrics of SDG 13's (13. b section) seek to "promote mechanisms for raising capacity for effective planning and management of climate change in less developed countries and small island developing States (UN General Assembly, 2023)". The SDG 13 may be achieved in two ways with millets. The first way millets might assist by reducing the negative consequences of climate change brought on by global warming. Second, millet-based agriculture may contribute to a decrease in the use of synthetic pesticides and fertilizers, which would lessen their harmful impact on the environment. Ladha *et al.,* (2020) have brought attention to the significance of (N) fertilizer in tying grain production systems and SDGs together. Similarly, increasing millet production by value-added processing might contribute to rural communities earning money and achieving SDG 1. Millets being rainfed crops, do not require standing water in the fields, so no need to develop big dams, and elaborated canal systems to get water to the farm. *"Essentially, millets have a far smaller environmental impact than wheat or rice".*

Millets are coveted not just by people but also by birds and other creatures due to their nutrient-rich grains. Birds have beaks that are specialized to hulling millet grains since they co-evolved with these crops, but ruminants like cattle have digestive systems that can break down the tough cellulose fiber in millet husk. Therefore, all of the usual by-products generated while preparing millets for human use, are added to the feed for poultry and cattle. In this process, millets promote avifaunal diversity. Once the root system is established, millets can survive dry weeks. The millet plants come back to life as soon as it starts to rain, and by the conclusion of the season, they are producing heavily. Therefore, millets are a good way to aggregate nutrients.

Millet's Comeback

The Sustainable Development Goals (SDGs)-particularly SDG 2 (Zero hunger), SDG 3 (Good

Box.1: The Millets Mindfulness: Indian Initiatives

- India is poised *to become the global millet hub* with more than 18 percent (>170 lakh tonnes) of the millets produced in Asia.
- India declared 2018 as the *"National Year of Millets"* to raise awareness about millet-centric health benefits, and boost millet production.
- Millet labelled as *"Nutri-cereals"* and included under Prime Minister's over arching scheme for holistic nutrition- "POSHAN ABHIYAN", in the 2018
- The vision and initiative of the Prime Minister of India led the United Nations General Assembly declare the year 2023 "International Year of Millets". It aims to contribute to the UN 2030 Agenda of Sustainable Development, particularly SDG-2 (Zero hunger), SDG-3 (Good health and Well-being), SDG-8 (Decent work and economic growth), SDG-12 (Responsible consumption and production), SDG-13 (Climate action) and SDG-15 (life on land).
- The Government of India has recognized millet as "Shree Anna" in 2023 and launched a set of "Seven Sutra" in the run-up to International Year of Millets 2023. The Seven Sutra outline areas in the enhancement of production/productivity, nutrition and health benefits, value addition, processing and recipe development, entrepreneurship/startup/collective development, awareness creation-branding, labelling and promotion, international outreach, and policy interventions for mainstreaming.

health and well-being), SDG 12 (Sustainable consumption and production), and SDG 13 (Climate action)—will be achieved if millets are helped to recover. Improving production and changing people's perceptions for them must be the main priorities. Putting in place government-sponsored initiatives to promote millets' nutritional and health benefits to the public as well as their production and consumption is a necessity. Funding for research and development of millets need be increased, and farmers need be given greater opportunities to connect to efficient value chains and markets.

Year 2023: The Year of Millets

In order to support "the actions intended for promoting consciousness and guiding policy focused on the dietary and health advantages of millet intake, and its appropriateness for farming under adverse and changing climatic conditions, as well as directing policy attention to improving value chain efficiencies," all global parties involved in the motion designating 2023 as the International Year of Millets, are urged to participate. Taking into account the knowledge gained from previous campaigns like the International Year of Pulses in 2016 and the International Year of Fruits and Vegetables in 2021, the UN Agency for Agriculture is attempting to create an action plan by working with external stakeholders like farmers and research organizations. Producing more nutrient-dense food for a growing population without overtaxing the world's limited land resources, is a formidable issue on a global scale, in line with FAO's vision of a sustainable and food-secure future for all (FAO, 2023). Actions taken will be in line with and supported by existing initiatives, such as the UN Decade of action on Nutrition: 2016–2025 which provides an umbrella for a large group of actors to work together to address malnutrition and other pressing nutrition issues (FAO, 2023).

Conclusion

Thus, it is undoubtedly recognized that millets have significant potential for food security and nutrition in the face of rising agricultural expenses, climate change, and an increase in the number of mouths to feed globally. They are also inherently resistant to the majority of biotic and abiotic stressors, have extra health advantages, and are cultivated with very few input costs. These characteristics highlight millets as the preferred crop for the global populace in light of rising worries about climate change and the loss of biodiversity in our food supply.

Acknowledgments

This synthesis is an attempt to put forward a synopsis of the millets for wiser and wider use by the researchers, planners, policymakers, corporates, public at large to make them able to appreciate the provision value and ecological services rendered by these orphan crop species throughout ecological ages in particular tohumankind and avifaunal diversity. The sources of the information, in addition to the author's own experiences, have been cited in the text. We are indebted to those who have contributed to the millets' research and development, especially to the sources of the studies and illustrations used in the present synthesis to develop a meaningful contribution for wider academic and professional utility.

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CORRECTION
Attention Readers!

In the Admission Notification of Ganpat University published in the University News Vol 61, No. 39 dated September 25 - October 01, 2023, inadvertently, the Intake Session and Last Date for Submission of Applications have been wrongly cited as "July 2023 and April 18, 2023".

The correct Intake Session and Last Date for Submission of the Applications May be read as:

JANUARY 2024 AND OCTOBER 14, 2023, respectively

The inconvenience caused is deeply regretted.

P S: Full Notification has been repeated on page No 39 in this Issue of the University News (Vol. 61, No.40) with correct dates for the convenience of the Readers.

Editor, University News

Mahatma Gandhi and Basic Education

Pravat Kumar Jena*

The present system of education has not been able to give right direction to the youths and it does not provide them affluent opportunities for their all round development to make them self reliant. Now-a-days the students are passing examinations and earning their degrees with first or higher divisions, but most of them are unable to become self reliant and incapable to face the challenges. So to overcome this condition there is a need of such education which was predicted by Mahatma Gandhi like 'Basic Education' or 'Nai-Talim'. Gandhi realized that the basic education was an essential component to the structural and socio-economic imbalances that were badly affected. It was the treatment for all the ills and evils of the society in India. His idea on basic education not only changed the educational system of India but also led a social revolution. This paper aims to understand and review the principles of Gandhiji on basic education which are assessed from his several writings. Some important features of Gandhiji's basic education are also described comparing present system of education.

Education is the process of acquisition of knowledge, skills, beliefs and moral habits. The main aim of education is to make the people better and to let them develop their own skills and confidence which are needed for their life. It reduces the challenges faced by individuals in their life and helps them to learn how to earn. The more knowledge one gains, the more opportunities open for the individuals to achieve better possibilities in career and in personal growth. It opens the mind for different situations, which help to solve problems of life effectively and to think critically about the world. Basic education is the most empowering force in the world which creates knowledge, builds confidence and opens the door of opportunity eliminating all obstacles (Wikipedia). For children, it is their key to open the door to a better life. A child gets the first education from his own family, learns from the own environment and gather learning experiences from the school. It is a social process which occurs only in social environment and without it no one can acquire experiences. The role of basic education is to socialise individuals and to keep society smooth and stable. It teaches a child to observe, understand and realize. It teaches to act decently, to be creative, to develop skills and to learn more things about life so that when the child grows up, he/she uses the basic education to build a better quality of life. However, the modern educational system of India is incapable to achieve humanitarian and peaceful social life. The present system of education is unable to contribute much to the individual as well as social development. In order to bring some social changes, proper and quality education is very much required for all. In this context, Mahatma Gandhi's scheme of basic education is an alternative measure to establish a new social order. Gandhiji's principle on basic education would be able to inspire the whole world with his ideas of truth, nonviolence, peace and love. His idea on handicraft is very important as it represents the culture and tradition of any country. It promotes the heritage of a country through the use of indigenous materials. Anyone can spend their free time to learn the various techniques related to handicrafts and can earn money by utilising the skills. It preserves traditional knowledge and talents. It encourages self-employment which is the best method to fight against current unemployment situations.

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Objectives

The objectives of the study are to:

- understand and review Gandhiji's principle of basic education and
- highlight some important features of Gandhiji's basic education and its relevance with present world.

Methodology

Some journals and e-contents relating to Gandjiji's model of basic education are studied. Several books on education are reviewed and some of Gandjiji's own writings are referred to find the significance of his ideas on basic education.

Basic Education according to Mahatma Gandhi

At Round Table Conference in London (1931) Mohandas Karamchand Gandhi, also known as

Mahatma Gandhi pointed out the ineffectiveness of the primary education system of India and the low percentage of literacy rate among Indian people. He blamed the policy of the British Government responsible for the pathetic situation in the field of mass education. Ghandiji described the main defects of the system of education as, "I am fully convinced that present system of education is not only wasteful but positively harmful. They would pickup evil habits. English has created a permanent bar between the highly educated few and the uneducated many." He further said, "let us now cry a halt and concentrate on educating the child properly through manual work not as a side activity but as a prime means of intellectual activity" (Maheswari). Mahatma Gandhi proposed his scheme of Basic Education (Nai Talim) in a well formulated approach to education in 1937 in his news paper 'Harijan'. In order to discuss different aspects of the scheme of education, an All India education conference was held in Wardha on 22nd and 23rd October, 1937. The conference is called Wardha Educational Conference and Gandhiji himself presided over the conference. After serious discussions, the following four resolutions were passed in the conference (Maheswari).

1) Free and compulsory education is to be provided for seven years on a nation- wide scale.
2) Mother tongue should be the medium of instruction.
3) The process of education throughout this period should have some manual and productive work and ability should be developed to engage them with handicraft work according to the environment of the child.
4) The proposed system of education would gradually be able to generate remuneration of the teachers.

Basic education or Nai Talim was based on the fundamental principle of "learning by doing". Gandhiji believed on action and hence his concepts of basic education can be classified as activity method or practical method. It was mainly a method of co-relation between book learning and doing activity through craft like gardening, weaving, spinning, carpentry, etc. According to him, a realistic scheme of education must be closely integrated with the physical and social environment of the student (Gandhi). He said, "It is called the new method of education, for it is not a foreign importation or imposition, but is consistent with the environment in India which is predominantly made up of villages. It believes in establishing equilibrium between the body, the mind and the spirit of which man is made. It is unlike the Western type which is predominantly militarist, in which the mind and the body are the primary care of education to the subordination of the spirit. This is best done when education is given through handicrafts. The other specialty is that it is designed to be wholly self-supporting. It does not, therefore, demand an expenditure of millions on education." (Harijan, 11-5-1947, p.147).

Some Important Features of Gandhiji's Basic Education

According to Gandhiji and his philosophy, the important features of basic education may be listed as below.

Free and Compulsory Education for All

Gandhiji wanted the basic education should be free and compulsory for all boys and girls between the ages of seven to fourteen. According to Gandhiji, "I am a firm believer in the principle of free and compulsory primary education for India. I also hold that we shall realize this only by teaching the children a useful vocation and utilizing it as a means for cultivating their mental, physical and spiritual faculties. Let no one consider these economic calculations in connection with education as sordid or out of place. There is nothing essentially sordid about economic calculations." (Harijan, 9-10-1937, p. 292)

Mother Tongue as Medium of Instruction

Gandhiji, believed that the medium of basic education should be the mother tongue. Strong mother tongue foundation leads to a much better understanding of the curriculum as well as a more positive attitude towards school. Language and mother tongue play an important role in the development of personal, social and cultural identity of a child. Children with a strong foundation in mother tongue can have deeper understanding of the curriculum and develop confidence to tackle any situation. When children develop their mother tongue, they will develop other essential skills, love towards mother tongue and incline towards motherland.

Craft Centred Education

Gandhiji emphasised on craft-centred education which had great importance in Indian scenario. In

Indian scenario, craft would make education self-supportive as it is not possible to educate all citizens and provide them government jobs. So, the craft centred education would help to provide employment opportunity to all citizens and make them self-sufficient. According to Gandhiji, the method of training the mind through village handicraft from the beginning would develop disciplined mind. Such practical productive work in education would to break down the existing barriers of discrimination between manual and intellectual workers. The scheme would increase the productive capacity and utilise their leisure profitably also (Maheswari). According to Gandhiji (Prabhu) "Craft, art, health and education should all be integrated into one scheme. Nai Talim is a beautiful blend of all the four and covers the whole education of the individual from the time of conception to the moment of death….. Instead of regarding craft and industry as different from education, I will regard the former as the medium for the latter." (Harijan, 10-11-1946, p. 394).

Development of Creativity and Critical Thinking

Gandhiji emphasised on the principle of 'learning by doing' which stimulates the individual's mind to think creatively and critically. His great emphasis on work-culture to the students from initial stage was to enable the students to start producing while learning. So, his primary aim of basic education was to utilise head, heart and hand rather than concentrating on reading or writing only. In July 1937, Ghandiji wrote in the Harijan, "By education I mean an all-round drawing out of the best in child and man-body, mind and spirit. Literacy is not the end of education nor even the beginning. It is only one of the means whereby man and woman can be educated. Literacy in itself is no education. I would therefore begin the child's education by teaching it a useful handicraft and enabling it to produce from moment it begins its training. Thus every school can be made self-supporting, the condition being that the State takes over the manufactures of these schools." (Harijan, 31-7-1937, p.197) in cultivating the spirit of co-operation, tolerance, collaboration and a sense of responsibility. All these qualities are required for the development of human personality which can create the pleasant balance between the individuals and social aim of education. Gandhiji always emphasised on collaborative learning. Craft work helps a child to acquire collaborative learning skills and to realize the value of honest labour.

Importance on Moral Education

Gandhiji thought that the peace is essential for human life which can be attained through education. Peace can be attained only through morality and ethics. According to him, education must be based on ethics and morality. Gandhiji advised to all students to consider morality and honesty as essential parts of their education. He said, **"**Our system of education leads to the development of the mind, body and soul. The ordinary system cares only for the mind." (Harijan, 9-11-1947, p. 401). "I attach far more importance to the cultural aspect of education than to the literary." (Harijan, 5-5-1946, p. 120)

Emphasis on Character Building

Education is the most powerful weapon which helps to build genuine characters of a student. The goal of education should consist of character-building. The character-building includes the moral, intellectual and social behaviour of a student under all circumstances. A student should develop personality, compassion, kindness, fair-mindedness and the spirit of dedication by virtue of education. Gandhiji said, **"**When it is remembered that the primary aim of all education is, or should be, the moulding of the character of pupils, a teacher who has a character to keep need not lose heart." (Harijan, 1-2-1933, p. 3).

Development of Self-reliance and Patriotism

The main purpose of basic education was to achieve an integral development of children and to create a sense of patriotism though practice of handicraft. Gandhiji desired that the basic education system should be self-supporting for every child by learning a craft or occupational skill for livelihood. He wanted education to ensure employment. He told "My Nai Talim is not dependent on money. The running expenses should come from the educational process itself. Whatever the criticisms may be, I know that the only education is that which is 'self-supporting'." (Harijan, 2-3-1947, p.48). He also said, "The teachers earn what they take. It stands for the art of living. Therefore, both the teacher and the pupil have to produce in the very act of teaching and learning. It enriches life from the commencement. It makes the nation independent of the search for employment". (Harijan, 11-5-1947, p. 145).

Development of Faith on Truth and Non-violence

Gandhiji was always considered that non-violence is an important and essential part of

education. Truth & Non- violence was the fundamental formula of Gandhiji's philosophy. Basic education too was also based upon the principle of truth and Non-violence. As he said "I want to see God face to face. God, I know, is Truth. For me the only certain means of knowing God is non-violence-*ahimsa*-love. I live for India's freedom and would die for it, because it is part of Truth. Only a free India can worship the true God. But my patriotism is not exclusive; it is calculated not only not to hurt any other nation, but to benefit all in the true sense of the word. India's freedom as conceived by me can never be a menace to the world" (Young India, 3-4-1924, p. 109).

Awareness on Social Services

Students should be involved in different community services to develop responsibility and create awareness on social services. Education must be based on social good, welfare for all and must uplift the human aspect. The basic education by Gandhi aimed at encouraging the spirit of service and self-sacrifice. Addressing the college students once he said (Shah) "Your education, if it is a vital thing, must shed its fragrance in your surroundings. You must devote a certain portion of your time daily to serving the people around in a practical manner. You must therefore, be prepared to take the spade, the broomstick and the basket. You must become voluntary scavengers of this holy place. That would be the richest part of your education, not learning by heart literary thesis." Mahatma Gandhi was a true social work, we should start it by ourselves.

Sensitise on Cleanliness and Untouchability

Students should be sensitised on merits and demerits of cleanliness and the evils of untouchability. Gandhiji had been opposing untouchablity and caste system from very beginning and putting relentless efforts to eradicate. He was arguing that Brahmins and untouchables were equal in his eyes. He was publicly rejecting the notion of high and low caste feeling. At the age of twelve, Gandhiji had disagreed his mother's warnings on not to touch an untouchable who used to clean their latrines in their house. He tried his best to break the centuries- old caste system and to remove the mark of untouchability from Hinduism. Gandhiji described (Prabhu) on his conception on Samagra Gramaseva in Harijan (17-3-1946, p.42) that "I will inculcate in them the importance of hygiene and sanitation, and when they come and ask me for a sweeper, I will tell them: "I will be your sweeper and I will train you all in the job."

Conclusions

Basic education is related to the basic needs and interest of the education for the development of a child. The aim of Gandhiji's basic education was to educate the students on crafts which would enable them to solve the problems of their livelihood and at the same time develop qualities of good citizenship. In Gandhiji's view, sound education must be rooted through the culture and moral value also. At present various educational committees are emphasising to make education job oriented and productive for self-employment. With the serious problem of educated unemployment situation among young men and women, the present educational system should be reformed on the spirit of Gandhiji's concept of basic education. Gandhiji's idea of basic education is valid and fruitful which may also be used as guiding principles in the present scenario. The modern education system needs to be reformed at elementary stage keeping in view of the moral value and employability features of the Gandhiji's basic education.

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Use of Education as a Tool for Empowerment

Bandaru Dattatreya, Hon'ble Governor of Haryana delivered the Convocation Address at the 10th Convocation Ceremony of Lingaya's Vidyapeeth (Deemed-to-be-University), Faridabad on March 24, 2022. He said, "We need to be ready to face challenges and convert them into opportunities. We have to move forward to become a knowledge society. The market for the developed world has reached a plateau and a new search has been launched for new markets for trade and new avenues for cheap labor and services. New developments in information technology further fueled the process of globalization." Excerpts

I am glad to be among you all on the occasion of the 10th convocation of Lingaya's Vidyapeeth, an important seat of learning in the private sector, a deemed-to-be university. Let me at the very outset put on record my congratulations and best wishes to the entire family of Lingaya's Vidyapeeth for playing an important role in imparting quality education to our students, who are the backbone and future of the nation.

It gives me immense pleasure to know that today 750 students from the streams of Science and Technology, Commerce, Management, Humanities, and Law. It is encouraging indeed to note that two hundred sixty-two of them are female students. Out of a total of 29 students who have scored 8.50 CGPA, sixteen are girls. I am really happy to see our daughters marching ahead in their pursuits to achieve excellence and self-reliance. It is a good omen indeed!

Ladies and gentlemen, India is on the cusp of total metamorphosis. The whole world is looking toward us with a great deal of hope. Our exemplary fight against Covid-19 showed the world our collective strength and determination to rise to the occasion and deal with any challenges with ease. Our companies did not only produce anti-Covid vaccines for ourselves but for the whole world. A new India is in the making and you all have to be an important partner in the build-back process.

Accordingly, we need to be ready to face challenges and convert them into opportunities. We have to move forward to become a knowledge society. The market for the developed world has reached a plateau and a new search has been launched for new markets for trade and new avenues for cheap labour and services. New developments in information technology further fueled the process of globalization.

Our students need to be a Jack of all trades. Diversity in learning and exposure to multifaceted experiments, research and skills have become the need of the order. The run-of-the-mill approach won't work. R&D spurs innovation, invention, and progress. Every campus should be a hub of R&D activities so that our students are aligned with emerging technologies like Artificial Intelligence, Internet of Things, Blockchain Smart spaces, generative AI, graph technologies, and the metaverse.

Dear students, our expectations from you are very high. We don't only wish to see you a life of happiness, prosperity and good health but also want you to give back to society so that one is left out. I shall be happy if some of you become good entrepreneurs and create job opportunities for others. As per the 6th Economic Census, we have nearly 59 million entrepreneurs in the country. It is indeed an impressive number but we want to have more and more entrepreneurs.

Similarly, we are all aware of the fact that many aspiring students have to give up their studies for want of resources, opportunities, facilities, and guidance. Never ever forget that you have a great responsibility towards the students – boys and girls – hailing from weaker sections of society such as backward classes, scheduled castes, scheduled tribes, and minorities. Do take care of them. Do their hand holding! We know all fingers cannot be equal but all fingers have to be equally strong to make a strong, vibrant and inclusive India.

I would like to appeal to all degree holders to focus on building empathy, sympathy, patriotism and social cohesion. Our diversity is our strength. You have to be the harbingers of hope, reform, transform and perform. You all have to be the agents of positive change. Through the alumni association, you can always do wonders. You can run incubation centres,

career counseling programmes, and offer sponsorship to poor students and whatnot! I call upon you all to actively participate in *Azadi Ka Amrit Mahotsav* and give your best during *Amrit Kaal* so that when India celebrates the centenary of Independence, our country should be an ideal epitome of equality, fraternity, liberty, justice, and prosperity for all.

Ladies and gentlemen, whatever I have stated so far in my convocation address are in sync with our new National Education Policy-2020, which has to be implemented by 2030 nationally but Haryana is geared up to achieve the task by 2025 itself. NEP-2020 effectively takes care of almost everything. From entrepreneurship, digitization, accreditation, inclusivity, innovation, flexibility, smart classes, and moral values to skill development, NEP-2020 strives to achieve excellence through affordability, accessibility, quality, equity, and accountability.

In conclusion, I would like to share some of the great observations made by the great monk Swami Vivekananda who said that education should cover all aspects of life– material, physical, moral, intellectual, spiritual, and emotional, as education is a constant process. He once said: "Education is not the amount of information that is put into your brain and runs riot there, undigested all your life. We must have life-building, man-making, character-making, assimilation of ideas."

Let us resolve collectively to use education as a tool for empowerment of all in general and those left out in particular.

I congratulate the medal winners, and degree awardees and wish good luck to all of you and thank Lingaya's Vidyapeeth administration, faculty members, and students for successfully organizing this convocation.

Thank You! Jai Hind! ❑

CAMPUS NEWS

IQAC National Seminar on National Education Policy–2020

The one-day National Seminar on 'National Education Policy─2020: Issues, Challenges and Prospects' was organized by the Internal Quality Assurance Cell (IQAC) of Aklia Group of Institutions, Goniana Mandi, Bathinda, Punjab on September 21, 2023. The basic objective of the event was to bring administrators, principals, faculty members, teachers, research scholars and students to a common forum that would provide an overview of the National Education Policy 2020 (NEP- 2020) about the vision of the new education system of India. The seminar was attended by the Principals, teacher educators, research scholars, and teachers who came from various places in Punjab, Rajasthan, Haryana, and Uttar Pradesh. The event was inaugurated by the Educationist Prof. J D Singh, GV PG College of Education, Sangaria who also delivered the Keynote Address.

Delivering the Keynote Address, Dr J D Singh discussed the main features of the National Education Policy- 2020 and its implementation. He stressed the need for an outcome-based and student-centric Indian education system. He also identified several issues that are currently plaguing our education system such as inadequate funding, lack of teachers, poor creative ideas, lack of technological equipment and other resources, etc. The challenges emanate from modern technology which has the potential to become an instrument of mass education. Challenges also emerge from globalization and the competitive nature of modern societies. The younger generation of educators and teachers should emerge with accountability, better access, a clear vision, and strategic planning of implementation of NEP- 2020 and show the world the strength of their scientific and reflective thinking, he said.

Mr. S Gurtej Singh Brar, Chairperson, Aklia Group of Institutions chaired the Inaugural Session and he spoke to adopt the new education policy in school and higher education system for quality enhancement. He highlighted the goal of education as the development of values, character and ethics keeping in view the NEP-2020. Further, educational institutions should be oriented to the modern trend in teaching and learning and adopt the age knowledge explosion and healthy academic curricular transactions.

Dr Vijay Grover, Principal, DAV College of Education, Abohar, Punjab and Dr Krishan Kant, Principal, Nehru College of Education, Aklian, Mandi Dabwali, Sirsa, Haryana were the resource persons of the event. Dr Vijay Grover said that a sound education sector plays an important role in the economic growth and development of a nation. He emphasized on native language as the medium of interaction, pedagogy, flexible and experiential learning, critical and creative thinking, and assessment reforms and provisions for increased accessibility to quality education. He also discussed the implications of the NEP- 2020 for academic leadership, highlighting the importance of aligning strategies with the policy to enhance education quality. Dr Krishan Kant discussed how the framework of the National Education Policy- 2020 is rooted in the Indian philosophical, social, and political thought tradition and focuses on multilingualism, an indigenous system of education and discussion-based pedagogy. He emphasized how academic leadership empowers educational leaders to guide students toward multidimensional success. He also highlighted the role of optimistic, helpful faculty in creating a conducive learning environment.

Dr. T S Gill, Convener and Principal, Aklia College of Education for Women, Goniana Mandi, Bathinda welcomed the gathering and gave a brief introduction to the theme of the Seminar and talked about the rationale behind organizing the Seminar on NEP -2020. While emphasizing the need for National Education Policy- 2020, he stated that there is a great need to reconstruct our educational system keeping in view the modern technologies to bring more quality in education. A few participants expressed their impressions of the seminar in the Valedictory Session. Mr. Parminder Singh co-convened the Seminar and proposed the Vote of Thanks.

Aadhvika National Award-2023 Conferred to USTM PRO

Dr Rani Pathak Das, Public Relations Officer (PRO) of the University of Science and Technology Meghalaya (USTM) has been conferred with the Aadhvika Woman Communicator of the Year - for

Communication & PR Professionals - National Award for 2023 by the Public Relations Council of India (PRCI) at a glittering function held at the Civil Services Officers Institute Auditorium at Chanakyapuri in New Delhi. Dr Das received the award from the hands of Shri Jual Oram, veteran politician and former Cabinet Minister in the presence of Mr MB Jayaram, Chairman, PRCI, Ms Geetha Shankar, National President, PRCI apart from a host of distinguished delegates.

The Aadhvika Annual Awards for Women 2023 is an initiative of PRCI to recognize and acknowledge women's potential, celebrate their achievements, and showcase their success. Seven categories of Aadhvika Awards, exclusively for women achievers were presented in the award function at this 17th Global Communication Conclave of PRCI. This signature award falls under the prestigious Chanakya Series of National Awards 2023.

Receiving the award, Dr. Rani Pathak Das said, "I must acknowledge the incredible team at USTM without whom this achievement would not have been possible. This award is a testament to our collective efforts. Expressing her gratitude to the Public Relations Council of India, she said, "It is a reminder that our efforts in the field of public relations are not in vain and that they have a meaningful impact on the organizations we represent and the communities we engage with".

The Aadhvika Awards include Aadhvika Woman Communicator of the Year–For Communication/ PR Professionals; Aadhvika Woman Entrepreneur of the Year-Recognizing woman entrepreneurs in self-businesses across Technology, Music, Media, Theatre, Visual arts, Crafts, Digital media, Health & Wellness, Beauty & Self-care; Aadhvika Sports Woman of the Year; Aadhvika Woman Author, Writer, Journalist, and Columnist for the best story of the Year; Aadhvika Woman Performer in Mental Health and Well-Being–Recognizing Woman Counsellors in Mental Health/ Family, Marriage, Addiction, etc. Therapists, Psychologists, Psychiatrists, Psychoanalysts, Therapists For providing guidance and interventions that support emotional and mental health and focus on preventing poor mental health for those in need; Aadhvika Woman Artiste of the Year in Art and Culture, which includes Dance, Drama, Music, Photography, and Painting, and Aadhvika Woman CEO of the Year-Government and Private Sector company heads, IAS, IPS, IRS, IFS, IES, or Heads of any organization.

International Conference on Security, Surveillance and Artificial Intelligence

A two-day International Conference on 'Security, Surveillance and Artificial Intelligence' is being organized by Techno India University, West Bengal during December 01-02, 2023. The event aims to gather scholars in the domain of computer science from all over the world to present advances in the fields of computer science and to foster creativity and exchange ideas and information. It will also provide an ideal environment to develop new collaborations and meet experts on basic research, application engineers, and industrial system developers. It provides a forum for academics and business professionals from the fields of Artificial Intelligence, cyber-security, and online privacy protection across the world to come together to share and enhance their knowledge and expertise. The Topics of the event are:

Track 1

Information Security

- Cyber-security.
- Authenticity, Privacy, Security and Trust Management.
- Multi-agent Systems for Information Security and Risk Management.
- Data Compression.
- Data Security in Healthcare Application.
- Information Security in Data Mining.
- Data Security in Embedded Systems.
- Data Security for Industrial Control and Manufacturing.

Track 2

Vision Based Surveillance

- Traffic Surveillance.
- Motion Detection.
- Activity Detection and Analysis.
- Face Detection and Recognition.
- Urban Surveillance.
- Object Tracking.

Track 3

Artificial Intelligence

- Machine Learning and Deep Learning.
- Natural Language Processing.
- Computer Vision.

- Artificial Neural Networks.
- Affective Computing.
- Information Systems Planning.
- Knowledge Representation and Reasoning.
- Robotics and Automation.
- Big Data Applications.
- Artificial Intelligence Applications in Science, Engineering, Healthcare and Medicine.

For further details, contact Convenor, Dr. Debashis Das, Department of Computer Science and Engineering, Techno India University, West Bengal-700091, Mobile No: +91-85849 17446, E-mail: *debashis.d@technoindiaeducation.com*. For updates, log on to: *www.technoindiauniversity.ac.in/events*.

International Conference on Emerging Trends in Literature, Language and Research

The one-day International Conference on 'Emerging Trends in Literature, Language and Research' is being organized by the **L**ovely Professional University, Phagwara, Punjab on October 31, 2023. The objective of the event is to disseminate emerging innovations, pedagogies, and various approaches in the literature, language, and research. Moreover, the philology, semiotics and syntax of language, literature, and research have undergone spacious changes due to the advancement of information and technology. So, the event aims to provide a unique forum to facilitate researchers, academicians, industrialists, scholars, psychologists, sociologists, anthropologists, artists, literary and cultural critics to share their research instincts.

The New epistemological discourses have brought a dynamic change in the perceptions of the intellectuals, methodologies, and thinking to calculate and address the nuances in society through literature, language, and research. These discourses have profoundly impacted scholars as they have transformed and widened the significance and scope of literature and language in the contemporary era. The Thrust Areas of the Event are:

Key Areas/Tracks

- Emerging Trends in Literature and Language.
- Climate Fiction and Anthropocene.
- Cyber Literature and Digital Media.
- Gender and Queer Studies.

Subthemes

- Climate Dynamics and Fiction.
- Cyber Literature and Digital Media.
- Medical Humanities.
- Social Media and Literature.
- Gender and Queer Studies.
- Marginalization.
- Equality, Diversity and Inclusiveness.
- Globalization Issues in Literature.
- Graphic and Twitter Fiction.
- Anthropocene.
- Ecofeminism and Ecocriticism.
- Biopolitics.
- Contemporary Literary Theory and Criticism.
- Data Visualization and Infographics.
- Digital Tools in Research.

For further details, contact the Organizing Secretary, Dr. Ajoy Batta**,** Professor and Head, Department of English and Hindi, School of Liberal and Creative Arts, Lovely Professional University, Jalandhar-Delhi, GT Road, Phagwara, Punjab-144411, Mobile: 099885 00220. For updates, log on to: *https://www.lpu.in*

AIU News

Faculty Development Programme on Academic Integrity and Professional Ethics

A five-day Faculty Development Programme on 'Academic Integrity and Professional Ethics' was jointly organized by the Association of Indian Universities, New Delhi─Academic and Administrative Development Centre (AADC), Shri Vaishnav Vidyapeeth Vishwavidyalaya (SVVV), Indore from June 20–24, 2023 through Online Mode. About forty participants were registered for the event. Eminent experts across the nation deliberated on academic integrity and professional ethics in the eight sessions. All the experts shared their perspectives and knowledge with the faculty members. The inaugural session began with the worship of Goddess *Saraswati,* followed by the welcome of the guests. Dr.

Anand Rajavat, Dean Academic, SVVV and Nodal Officer of the event introduced the programme and its objectives. He informed the different organizations and cities where the participants had registered. He introduced the speakers who were from renowned academic institutions. Dr. Rajavat also explained the importance of academic integrity as the moral code or ethical policy of academia.

Dr. Upinder Dhar, Vice Chancellor, SVVV delivered the welcome address and stated the role of academic integrity, ethics, and values in academics. Dr. Dhar said that SVVV is one of the universities amongst 10 Universities in India, selected by AIU for organizing such Faculty Development Programmes. Dr. Dhar said that for institutions, it is a matter of creating an environment that promotes responsible conduct by embracing standards of excellence, trustworthiness, and lawfulness. The Chief Guest and Keynote Speaker on the occasion was Prof. P B Sharma, Vice Chancellor, Amity University, Gurugram (Haryana). Prof. Sharma said that academic integrity and ethics in professionalism is the prime need of society. He emphasized on the importance of academic conduct and shared his experiences of ethical misconduct in report writing. He also focused on professional integrity which involves behaviors that are consistent with professional and ethical expectations of one's field. Dr. Sharma emphasized mostly the four basic acts of morality i.e., Moral is reasonableness; respect for persons; tolerance of diversity, and moral hope. The inaugural session concluded with Vote of Thanks by Dr. Rakesh Kumar Malviya, Associate Professor, Mechanical Engineering Department, SVITS, SVVV, Indore.

Dr. Ravi Shankar, Professor (HAG), Department of Management Studies, IIT Delhi spoke on 'Academic Integrity and Professional Ethics: Guidelines and Few Suggestions'. He emphasized that the independence and reputation of the University rest in the hands of those who are scrupulous in their search for truth. Dr. Shankar said that pressures that cause academic misconduct are deadlines, productivity and competition, collaborative and individual work, criticism and trust, multiple roles, lack of information, etc.

Dr. Balkrishna E Narkhede, Professor, NITIE, Mumbai spoke on 'Essence of Academic Integrity and Professional Ethics for Performance Excellence of an Educational Institute'. Dr. B E Narkhede said that performance excellence is a multidimensional concept, and its different dimensions call for different forms of recognition and reward. If teaching quality is to be maintained and enhanced, teaching excellence must be recognized and rewarded. He emphasized that the criteria for individual teaching excellence are no more difficult to enunciate and evaluate than those for research excellence to achieve overall institutional performance excellence. Dr. Narkhede also suggested that there must be excellence at departmental and institutional levels. They can however be developed on the foundation of individual excellence.

Dr. Premanand S Chauhan, Director and Professor, S D Bansal College of Technology, Indore conducted the session on 'Academic Integrity and Professional Ethics: Social Implications'. Dr. Chouhan discussed the social implications of academic integrity and professional ethics. He emphasized the brain functioning system and IQ measurement test. He said that personal and professional ethics should be governed properly as personal ethics were learned from home and professional ethics were learned from management.

Dr. A C Shukla, Professor, Department of Mechanical Engineering, UEC Ujjain spoke on 'Ethics in Research Publications'. Dr. A C Shukla suggested that the researchers should follow ethics in research publications. He pointed out that accurate and ethical reporting is crucial to the quality of scientific research that is published. Unethical practices such as falsification of data and plagiarism cause long-term damage to the dependability of published literature. He said that publication and research ethics involve systematizing, defending, and recommending concepts of right and wrong conduct in scientific research experiments. Knowing and following ethical guidelines while conducting research is essential.

Dr. G S Dangayach, Professor, HAG, Department of Mechanical Engineering NIT Jaipur spoke on 'Student-Centered Teaching Methods'. Dr. G S Dangayach discussed the various student-centered teaching methods. He also highlighted how educational resources for academic integrity should be engaging to students and designed so that they can be effectively embedded in the curriculum. Dr. Dangayach said that the development of a teaching and learning approach has implications for institutional initiatives that will entail promoting academic integrity education, supporting students' academic writing development, and employing assessment practices that are integral to student learning.

Dr. Santosh Dhar, Rector and Dean (FDSR) SVVV, Indore conducted the session on 'Academic Fraud and Quality Assurance'. Dr. Santosh Dhar suggested that academic integrity is essential to avoid academic fraud in the form of academic dishonesty or misconduct in academic exercise/activity. She emphasized the role of faculties and teachers to avoid various academic frauds. Dr. Dhar also discussed in detail the various types of academic fraud such as fabrication, cheating, deception, plagiarism, impersonation, bribery, sabotage, and professional misconduct.

Dr. Upinder Dhar spoke on 'Promotion of Academic Integrity and Prevention of Plagiarism in Higher Educational Institutions'. Dr. Dhar emphasized the higher education rules and regulations on academic integrity to generate awareness, develop institutional mechanisms, and develop systems to detect plagiarism. Dr. Dhar stressed the conduction of awareness programs and training for the promotion of academic integrity in research and amongst staff. He said that the researchers should not be involved in any unethical activities that cause hindrance to the harmony of the Institution. Dr. Dhar also discussed the different levels of plagiarism and the various penalties of plagiarism.

Dr. P C Tewari, Professor, Mechanical Engineering Department, NIT Kurukshetra deliberated on 'Academic Integrity, Values and Ethics'. Dr. P C Tewari said that academic integrity is a way to change the world. Change the university first; then change the world. Dr. Tewari said that honesty is an indispensable foundation of teaching, learning, research, and service, and a necessary prerequisite for the full realization of trust, fairness, respect, and responsibility. It is essential that academic policies and community practices send a clear message that falsification of data, lying, cheating fraud, theft, and other dishonest behaviors are unacceptable. He also believed that many teachers, students, and administrators embrace the principles of academic integrity because they know that the goals of teaching, learning, and research can only be accomplished in environments in which ethical standards are upheld.

The programme ended with the Valedictory Session. After welcoming guests, Dr. Rakesh Kumar Malviya, Coordinator of the event presented the programme report. The Welcome Address was delivered by Dr. Upinder Dhar. Feedback on the programme was given by the participants of the programme. Dr. Anand Rajavat proposed the Vote of Thanks. The session concluded with the National Anthem.

Faculty Development Programme on Outcome-based Education

A nine-day Faculty Development Programme on 'Outcome-based Education for Effective Learning and Teaching' was jointly organized by the Association of Indian Universities, New Delhi—Academic and Administrative Development Centre (AADC), Academy of Maritime Education and Training (Deemed-to-be-University) Chennai, Tamil Nadu on July 19-27, 2023 through Online Mode. About 290 participants successfully completed the programme and received the certificate. There were seven sessions including the assessment of the programme. The experts from various Universities/National Institutes of India shared their experiences and educated the faculty members about the importance of Outcome-based Education (OBE) and its alignment with the National Education Policy-2020. All the sessions were conducted as interactive sessions to allow all the participants to interact with the experts to clarify their doubts and the guidelines provided with the case studies conducted to evaluate the effective implementation of Outcome-based Education in some of the Universities.

During the Inaugural Session, the Welcome Address was delivered by Dr. T Sasilatha, Dean International Relations, AMET. Col. (Dr.) G Thiruvasagam, Pro Chancellor, Academics delivered the Presidential Address and highlighted the initiatives of the Association of Indian Universities (AIU) and the importance of OBE for effective teaching and insisted on the need for the effective teaching from classroom to assessment. He pointed out that continuous and effective implementation will help the students to update their skills and abilities in their domain and to be industry-ready.

Followed by the Presidential Address, the inaugural session was delivered by Dr. V Rajendran, Vice Chancellor, AMET. He appreciated the AIU for developing the Academic and Administrative Development Centre to perfectly balance the academics and administration in an institution. He delivered about ways and procedures of outcome-based education which unleashed the potential of the faculty towards a student-centric approach. He pointed out the essential of utilizing the ICT tools to interact and engage the students for effective learning.

During the Technical Session, the Guest Speaker, Dr. T T Mirnalinee, Professor and Head, Department of Computer Science and Engineering, SSN College of Engineering, Chennai. delivered the session on 'OBE-Process Flow'. She discussed on essential shift from

student student-centered approach to learner learner-centered approach. She mentioned the Framework of the National Board of Accreditation with a sample programme that was conducted and implemented effectively at SSN College of Engineering.

Dr. G Kulandaivel, Professor, Department of Electrical Electronics and Communication Engineering, National Institute of Technical Teachers, Training and Research, Chennai discussed the ICT tools for effective teaching and learning. He emphasized the role of ICT in modern-day learning and showed various tools and their benefits. He also elaborated on how the tools can be used in online/offline teaching to make our class interactive in a better way. He showcased the utilization of tools from different platforms that are available to use and thereby interacted with the participants.

Dr. R Varadharajan, Consultant, Pranav Consultation, Chennai discussed Outcome-based Education: Instructional Design for Active Learning. He pointed out the information on the innovative curricula and social engagement. He emphasized the significance of Sustainable Development Goals (SDGs) and their adoption in this modern day is essential as well as the difficulties we might face and how to overcome them. He insisted that the implementation of ethical practices to preserve the globe is essential nowadays, and this has to be adopted in modern education.

Dr. P Ezhilarasi, Professor and Head, Department of Electronics and Communication Engineering, St. Joseph's College of Engineering, Chennai delivered the session on 'Outcome-based Education'. She shared her expertise in OBE from the traditional system. She explained the function, attributes, and components of OBE and its essential in the implementation of the National Education Policy-2020. She suggested the proven assessment methodologies to be taken to evaluate the performance of the learners with the conducted case study.

Dr. S Renukadevi, Professor and Head, Department of Engineering Education, National Institute of Technical Teachers, Training and Research, Chennai was the Guest Speaker and she delivered the lecture on 'Resilient Pedagogy'. She explained the various pedagogical techniques needed for modern-day teaching and learning. She emphasized the significance of Generation Z learners.

Dr. A Abudhahir, Director IQAC, Abdur Rahman Crescent Institute of Science and Technology, Chennai was the session speaker. He discussed the case studies conducted in the Institution on Outcome-based Education. He described the effective outcome after implementing the process and its benefits. He showcased the impacts of the implementation of Outcome-based Education with the assessment for the course control systems and that gave clear insights on developing effective CO, PO's.

Dr. K Chitra, Professor and Deputy, Director, Directorate of Quality Assurance and Accreditation, VIT Chennai was the Guest Speaker. The Professor insisted on the necessity of OBE and its alignment with the National Education Policy- 2020. She discussed the various challenges involved in implementing the OBE and the adaptable strategies for the same.

During the Valedictory Session, Ms. J Padmapriya, Scientist, Department of EEE, AMET delivered the welcome address and introduced the guests to the session. Dr. Deepa Rajesh, Vice President, Academics and Nodal Officer, AADC, AMET delivered the Presidential Address and pointed out the significance of Outcome-based Education and the necessity of effective implementation to equip the students to encounter the design and developments of cutting-edge technologies. She highlighted the major initiatives taken by the Association of Indian Universities toward the various avenues of faculty enrichment and the scope for the faculty members for their academic enrichment.

Dr. Vikas Tyagi, Professor and Head, School of Business, Dev Bhoomi University, Uttarakhand delivered his address and pointed out that the quality of education lies in the effective implementation of outcome-based education. He interacted with the participants and provided a clear vision of the impacts of the implementation of the same and how that could be overcome. Participants provided their feedback and appreciated the organizers for identifying suitable resource persons as Chief Guest for all the sessions and providing detailed insights and AIU for sponsoring these kinds of initiatives. Ms. J K Vaijayanthimala, Research Scholar, Department of EEE, AMET proposed the Vote of Thanks to all the guests, speakers, participants, session chairs and organizing committee for making the event more successful. ❑

THESES OF THE MONTH

SCIENCE & TECHNOLOGY
A List of doctoral theses accepted by Indian Universities
(Notifications received in AIU during the month of June-July, 2023)

BIOLOGICAL SCIENCES

Biotechnology

1. Jain, Abhishek. **Role of probiotics on arsenic induced toxicity in Gut microbiome brain and embryonic development of Zebrafish**. (Prof. Subodh Kumar Jain), Department of Biotechnology, Dr Harisingh Gour Vishwavidyalaya, Sagar.

2. Monika. **Development of inhibitors to target Isocitrate lyases of Mycobacterium tuberculosis H37Rv**. (Dr. Vibha Gupta), Department of Biotechnology, Jaypee Institute of Information Technology, Noida.

Microbiology

1. Pabari, Kinjal Kirankumar. **Biochemical and molecular characterization of lactobacilli with synergistic synbiotic properties**. (Dr. Ramesh Kothari), Department of Microbiology, Saurashtra University, Rajkot.

2. Sundaram, Hema. **Study of the occurrence of low-level rifampicin resistance in mycobacterium tuberculosis strains with discordant phenotypic and genotypic susceptibility test results**. (Dr. Farah Deeba), Department of Microbiology, CMR University, Bangalore.

Zoology

1. Ahmad, Zaved. **Delineating the hepatotoxic and inflammatory response of environmental carcinogens on liver and protective mitigation by phytochemical supplementation**. (Prof. Subodh Kumar Jain), Department of Zoology, Dr Harisingh Gour Vishwavidyalaya, Sagar.

2. Sethy, Tanmaya Rani. **Studies on diversity of spiders in Sagar District (M P) and assessment of its egg sac silks**. (Prof. J D Ahi), Department of Zoology, Dr Harisingh Gour Vishwavidyalaya, Sagar.

EARTH SYSTEM SCIENCES

Atmospheric Science

1. Dutta, Soumi. **Towards improved estimates of global cloud fraction by addressing uncertainties involved in satellite cloud remote sensing**. (Prof. Sagnik Dey and Prof. Larry Di Girolamo), Centre for Atmospheric Sciences, Indian Institute of Technology Delhi, New Delhi.

Geology

1. Kiran, S. **Depositional environment and source rock potential of coal in parts of the Pranhita Godavari Basin, India**. (Dr. Kakoli Gogoi), School of Sciences, Indira Gandhi National Open University, New Delhi.

ENGINEERING SCIENCES

Agricultural Engineering

1. Sahoo, Swapan Sagarika. **Study on biochar preparation from bamboo and pigeon pea stalk and its application for enhancing biogas production and crop yield**. (Prof. V K Vijay and Prof. Ram Chandra), Centre for Rural Development & Technology, Indian Institute of Technology Delhi, New Delhi.

Biochemical Engineering

1. Ahlawat, Aakanksha. **Laccase and manganese peroxidase diversity in cythuus bulleri and mechanisms employed towards dye degradation/ adaptation**. (Prof. R Elangovan and Prof. R Mishra), Department of Biochemical Engineering and Biotechnology, Indian Institute of Technology Delhi, New Delhi.

2. Sharma, Jyoti. **Molecular characterization of a biosurfactant from Franconibacter sp. and its application in oil recovery**. (Prof. Preeti Srivastava and Prof. D Sundar), Department of Biochemical Engineering and Biotechnology, Indian Institute of Technology Delhi, New Delhi.

Biomedical Engineering

1. Mohd Anees. **Development of polylactic acid based biodegradable nanoparticles for concomitant delivery of cancer stem cell inhibitor and primary chemotherapeutic drugs for cancer therapy**. (Prof. Harpal Singh), Centre for Biomedical Engineering, Indian Institute of Technology Delhi, New Delhi.

Chemical Engineering

1. Sony. **Studies on catalytic decomposition of hydrogen iodide in sulphur iodine cycle for hydrogen production**. (Prof. Ashok N Bhaskarwar), Department of Chemical Engineering, Indian Institute of Technology Delhi, New Delhi.

Civil Engineering

1. Gidday, Biruk Gissila. **Physical and numerical modeling of rainfall triggered shallow landslides in Central Highlands, Ethiopia**. (Prof.G V Ramana and Prof. R Ayothiraman), Department of Civil Engineering, Indian Institute of Technology Delhi, New Delhi.

2. Reddy, Boreddy Surya Prakash. **Application of hydrogel in paddy field for soil moisture retention and yield optimization**. (Dr. Shibu K Mani), Department of Civil Engineering, Christ University, Bangalore.

Computer Science & Engineering

1. Bijeesh, T V. **Design and development of generic framework for surface water delineation and monitoring using a hybrid level set algorithm on landset multi-spectral data**. (Dr. Narasimha Murthy K N), Department of Computer Science & Engineering, Christ University, Bangalore.

2. Dominic, Denny. **A Multi parameterized modified local binary pattern for lung cancer detection by deep learning methods**. (Dr. Balachandran K), Department of Computer Science & Engineering, Christ University, Bangalore.

3. Kibret, Samuel Wedaj. **Decentralized mechanisms to attest, recover and update IOT network**. (Prof. Kolin Paul), Department of Computer Science & Engineering, Indian Institute of Technology Delhi, New Delhi.

4. Ranjan, Sidharth. **Cognitive modeling of Hindi synthetic choice phenomena**. (Prof. Sumeet Agarwal and Prof. Rajakrishnan Rajkumar), Amar Nath and Shashi Khosla School of Information Technology, Indian Institute of Technology Delhi, New Delhi.

5. Seshadri, Ovia. **Securely improving performance in POW blockchains using links and anchors**. (Prof. Subodh V Sharma and Prof. Vinay J Ribeiro), Department of Computer Science & Engineering, Indian Institute of Technology Delhi, New Delhi.

Electronics & Communication Engineering

1. Dharmender. **Design and performance analysis of Tunnel field effect transistor and its application**. (Dr. Satyendra Kumar), Department of Electronics & Communication Engineering, Jaypee Institute of Information Technology, Noida.

2. Gupta, Shiv Narain. **Novel first-order all pass filters using CMOS transistors with applications in analog signal processing**. (Prof. Jitendra Mohan and Dr. Bhartendu Chaturvedi), Department of Electronics & Communication Engineering, Jaypee Institute of Information Technology, Noida.

Electrical & Electronics Engineering

1. Brahma, Debargha. **Dynamic flexibility studies in power systems**. (Dr. Nilanjan Senroy), Department of Electrical Engineering, Indian Institute of Technology Delhi, New Delhi.

2. Jaspreet Singh. **Design and analysis of 4H-SiC based plannar junctionaless FETs for SUB-10 NM regime**. (Prof. M Jagadesh Kumar), Department of Electrical Engineering, Indian Institute of Technology Delhi, New Delhi.

3. Kaul, Piyush. **Geometric modelling and understanding of deep neural networks**. (Prof. Brejesh Lall), Department of Electrical Engineering, Indian Institute of Technology Delhi, New Delhi.

4. Parmar, Vivek Kamalkant. **Non-volatile memory-centric computing advances**. (Prof. Manan Suri), Department of Electrical Engineering, Indian Institute of Technology Delhi, New Delhi.

5. Paul, Pratiti. **Jamming in free space optical systems**. (Prof. Manav Bhatnagar), Department of Electrical Engineering, Indian Institute of Technology Delhi, New Delhi.

6. Prakash, Anurag. **Graph signal processing and geometric deep learning in optical mesh networks**. (Prof. Subrat Kar), Department of Electrical Engineering, Indian Institute of Technology Delhi, New Delhi.

Energy Studies

1. Singh, Sandeep Kumar. **Performance studies of waste heat assisted solar drying and distillation systems**. (Prof. S K Tyagi and Prof. S C Kaushik), Department of Energy Science & Engineering, Indian Institute of Technology Delhi, New Delhi.

2. Verma, Abhishek. **Energy and exergy analysis of hybrid compression-absorption cycles for colling applications**. (Prof. S K Tyagi and Prof.S C Kaushik), Department of Energy Science & Engineering, Indian Institute of Technology Delhi, New Delhi.

Material Science and Engineering

1. Pandey, Kalpana Lalit Chandra. **Studies on zero valent iron loaded biodegradable polymeric particles for groundwater remediation**. (Prof. Sampa Saha), Department of Materials Science and Engineering, Indian Institute of Technology Delhi, New Delhi.

Mechanical Engineering

1. Gupta, Ankita. **Nonlinear analysis of variable stiffness composite and auxetic honeycomb sandwich panels**. (Prof. S Pradyumna), Department of Applied Mechanics, Indian Institute of Technology Delhi, New Delhi.

Sanitary Engineering & Technology

1. Dalvi, Vivek Suresh. **Development of a novel recirculation photobioreactor for on-site treatment of municipal wastewater, and investigations on valorization of biomass into high-value product streams**. (Prof. Anushree Malik and Prof. Pushap Chawla), Centre for Rural Development & Technology, Indian Institute of Technology Delhi, New Delhi.

Telecommunication Engineering

1. Sharma, Kirti Kant. **Physical layer security in energy harvesting cooperative networks**. (Prof. Ranjan Bose), Bharti School of Telecommunication Technology and Management, Indian Institute of Technology Delhi, New Delhi.

MATHEMATICAL SCIENCES

Mathematics

1. Kamboj, Antia Rani. **algorithm approach for getting optimal solution of transportation problem and travelling salesman problem**. (Dr. Hemlata), Faculty of Science, Tantia University, Sri Ganganagar.

2. Mackolil, Joby. **Sensitivity analysis of heat transport in nanofluids with Marangoni convection**. (Dr. Mahantesh B), Department of Mathematics, Christ University, Bangalore.

3. Ray, John. **A study on restrained geodetic domination in graphs**. (Dr. Sangeetha Shathish), Department of Mathematics, Christ University, Bangalore.

4. Samuel, Libin Chacko. **A study on upper domatic number and its variants in graph**. (Dr. Mayamma Joseph), Department of Mathematics, Christ University, Bangalore.

5. Tanwar, Jagadish. **A study of interplay among negation, redistribution and retainment in an uncertain environment**. (Dr. Amit Srivastava), Department of Mathematics, Jaypee Institute of Information Technology, Noida.

MEDICAL SCIENCES

Ayurveda

1. Debasis, Kundu. **Clinical significance of Vedhya Sira in relation with Rakta Mokhsana**. (Dr. Subhash Kumar Upadhyay), Department of Ayurveda, Tantia University, Sri Ganganagar.

Homeopathy

1. Pandya, Nishant Ghanshyambhai. **Utility of clinical repertories especially Oscar boericke repertory in bed-side cases**. (Dr. Rinku Biswas), Department of Homeopathy, Tantia University, Sri Ganganagar.

2. Rajendra Singh. **Comparative study on efficacy of homoeopathic remedies on geriatric hypertensive cases in old age home and in the community, using OPQoL**. (Dr. Parveen Kumar Sharma), Department of Homeopathy, Tantia University, Sri Ganganagar.

PHYSICAL SCIENCES

Chemistry

1. Alam, Shahenvaz. **Studies on microbial L-asparaginases and amidases and their application in food industry**. (Prof. Sunil Kumar Khare), Department of Chemistry, Indian Institute of Technology Delhi, New Delhi.

2. Ali, Amjad. **Stereoselective 1,4 and 1,6-addition to quinone methides**. (Prof. Ravi P Singh), Department of Chemistry, Indian Institute of Technology Delhi, New Delhi.

3. Benny, Libina. **Selective oxidation of heterocyclic alcohols using carbon based modifies electrodes**. (Dr. Anitha Varghese), Department of Chemistry, Christ University, Bangalore.

4. Cherian, Anila Rose. **Modification of carbon based electrodes as robust scafold for electrochemical sensing of vitamins and hormones**. (Dr. Anitha Varghese), Department of Chemistry, Christ University, Bangalore.

5. Hanuman Singh. **Protein engineering: Design, synthesis and functional properties of peptidomimetic foldamers**. (Prof. V Haridas), Department of Chemistry, Indian Institute of Technology Delhi, New Delhi.

6. Ritu. **Light-induced organic transformations using homogeneous photocatalysis**. (Prof. Nidhi Jain), Department of Chemistry, Indian Institute of Technology Delhi, New Delhi.

7. Tewari, Shailabh. **Crystal engineering of lanthanide based polyoxomolybdates: The taxonomy of exploring a structural landscape**. (Prof. Anunachalam Ramanan), Department of Chemistry, Indian Institute of Technology Delhi, New Delhi.

8. Yadav, Priyanka. **Synthesis of quasi two-dimensional Transition Metal Dichalcogenides (2D TMDs) for efficient photo-electrochemical and photodetector applications**. (Prof. A K Ganguli), Department of Chemistry, Indian Institute of Technology Delhi, New Delhi.

Physics

1. Ekta. **Investigations of the magnetic anisotropy, exchange bias and ferromagnetic resonance in Co, Ni81Fe19 and Co/Ir22Mn78 thin films**. (Prof. Sujeet Chaudhary), Department of Physics, Indian Institute of Technology Delhi, New Delhi.

2. Gupta, Nanhe Kumar. **Fabrication and investigations on the sputtered CoFeB based heterostructures comprising of transition metal dichalcogenides and heavy metals**. (Prof. Sujeet Chaudhary), Department of Physics, Indian Institute of Technology Delhi, New Delhi.

3. Joshi, Rajneesh. **Coherence induced polarization and spectral studies of electromagnetic optical fields**. (Prof. Bhaskar Kanseri), Department of Physics, Indian Institute of Technology Delhi, New Delhi.

4. Nithin, V. **Design of efficient optical and electrical pumping configurations for semiconductor optical amplifiers and lasers.** (Prof. M R Shenoy), Department of Physics, Indian Institute of Technology Delhi, New Delhi.

5. Pandey, Lalit. **Magnetotransport and spin dynamics investigations on the te-based topological materials and their heterostructures fabricated by sputtering**. (Prof. Sujeet Chaudhary), Department of Physics, Indian Institute of Technology Delhi, New Delhi.

6. Raj, Ashlin M. **Cost effective synthesis of carbon nanoparticles and exploring the fluorescence and electrochemical applications**. (Dr. Manoj B), Department of Physics, Christ University, Bangalore.

7. Ramaya, A V. **Graphene quantum dots: Facile synthesis, fruitful properties and fascinating application**. (Dr. Manoj B), Department of Physics, Christ University, Bangalore.

8. Shakya, Poornima. **Self-organization and synthetic gauge field for ultra-cold bosons from atom-photon interaction inside a cavity**. (Prof. Sankalpa Ghosh), Department of Physics, Indian Institute of Technology Delhi, New Delhi.

9. Sonu Kumar. **Analytical and numerical studies of laser wakefield acceleration in bubble regime**. (Prof. H K Malik and Prof. Dhananjay K Singh), Department of Physics, Indian Institute of Technology Delhi, New Delhi.

10.Sunaina. **Mean gradient descent: A new optimization approach with applications to inverse problems in imaging**. (Prof. Kedar Khare), Department of Physics, Indian Institute of Technology Delhi, New Delhi.

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Dnyanganga Shikshan Prasarak Mandal,
Malwadi Sanchalit
Shripatrao Chougule Arts and Science College,
Malwadi-Kotoli
Tal-Panhala, Dist-Kolhapur 416230 (M.S.)
(Affiliated to Shivaji University, Kolhapur)
(Permanently Granted)

WANTED

Applications are invited from eligible candidates for the following post:

Sr. No	Name of Post	Vacant Posts	Unreserved (Open) Post
1	**Principal**	01	Open to All-1

Note :- For detailed information about Post, Qualifications and other terms and conditions please visit University **website: www.unishivaji.ac.in.**

Place :- Malwadi-Kotoli
Date :- 25-09-2023

Secretary
Dnyanganga Shikshan Prasarak Mandal, Malwadi,
Post-Kotoli Tal-Panhala, Dist-Kolhapur (M.S.)

CENTRE FOR SOCIAL STUDIES (CSS), SURAT
RECRUITMENT FOR THE POST OF DIRECTOR

Applications/nominations are invited from eminent persons for the **post of Director** of the Centre, an institution funded jointly by the Indian Council of Social Science Research, New Delhi (Ministry of Education, GoI) and the Government of Gujarat. An autonomous social science research institute of more than fifty years of standing, the CSS is involved in conducting studies on understanding the development processes and uses such knowledge for interventions at different levels.

Candidates with a good academic background; a Ph.D. in any social science, with proven research ability. Publications/papers in high quality discipline journals as per UGC norms are essential. A minimum of five years' experience as a Professor in a university/institution of higher learning/research institute, with significant expertise in administration and research. And a willingness to interact with other similar institutions, development agencies and governments.

The retirement age of the Director is 65 years and candidate should not be more than 62 years of age at the time of application. The Director's term of appointment is 3 (three) years or until he/she attains the age of 65 years, whichever comes first. Pay Scale: Rs. 37400-67000 + GP Rs. 10000/- plus admissible allowances and perquisites according to the rules of the Centre.

Applications/nominations, with complete bio-data, should be addressed to **The Chairman, Search and Selection Committee, Centre for Social Studies, Veer Narmad South Gujarat University Campus, Udhna-Magdalla Road, Surat – 395 007, Gujarat**, **OR** this may be **mail at the E-mail: info@css.ac.in** and must reach **on or before 02 November 2023.**

The Search and Selection Committee reserves the right to reject any application without assigning the reason thereof.

Telephones: (0261) 2977172, 2977174 Fax: 2977017
E-mail: info@css.ac.in • Website: www.css.ac.in

NUTAN MAHAVIDYALAYA SELU DIST. PARBHANI (M.S.)

WANTED

Applications are invited from the eligible candidates for the following **Permanent Non Granted** posts in Nutan Mahavidyalya Selu, Tq. Selu Dist. Parbhani run by Nutan Vidyalaya Shikshan Santha, Selu Tq. Selu Dist. Parbhani. The Applications duly completed in all respect should reach on the following address **within fifteen days** from the date of publication of this advertisement. The candidates of Reserve Category should submit one copy of their application to the **Assistant Registrar (Special Cell),** Swami Ramanand Teerth Marathwada University, Nanded by **Registered Post Only.**

Sr No	Subject	Post	No. of Post	Reservation
01	Microbiology	Assistant Professor	02	OPEN - 05, SC - 02, ST - 01, VJ(A) - 01, OBC - 02, EWS - 01.
02	Computer Science	Assistant Professor	02	
03	M.A. Marathi	Assistant Professor	02	
04	M.A. History	Assistant Professor	02	
05	Sociology	Assistant Professor	01	
06	B.C.A.	Assistant Professor	03	
Total Post			**12**	

Permission as per NOC No. JDHE Nanded / NOC / 2022-23/5739 Dated : 08/12/2022.

Details of advertisement & Application format is available on www.srtmun.ac.in and also on our college website : www.nutanmahavidyalaya.com.

Address for correspondence: Principal, Nutan Mahavidyalaya, Selu Jintur Road, Dist. Parbhani 431503.

Dr. S. M. Loya
President
Nutan Vidyalaya Shikshan Sanstha, Selu

Dr. V. K. Kothekar
Secretary

Dr. Uttam Rathod
Principal
Nutan Mahavidyalaya, Selu Dist. Parbhani

Navkonkan Education Society's

Dr. Datar Arts, Dr. Behere Science and Shri Pilukaka Joshi Commerce College, Chiplun

Tal : Chipun, Dist : Ratnagiri, PIN - 415605

APPLICATIONS ARE INVITED FOR THE FOLLOWING POST FROM THE ACADEMIC YEAR 2023-24.

AIDED

Sr. No.	Cadre	Subject	Total No of Post	Post Reserved for
1	**Assistant Professor**	Chemistry	01	01-OBC

The Advertisement approved subject to the final decision in the Writ Petition No.12051/2015.

Posts for the reserved category candidates will be filled in by the same Category Candidates (Domicile of State of Maharashtra) belonging to that particular category only.

Reservation for women will be as per **University Circular No. BCC/16/74/1998 dt. 10th March, 1998, and 4% Reservation shall be for the person with the disability as per University Circular No. Special Cell/ICC/2019-20/05 dt. 05th July 2019.**

Candidates having knowledge of Marathi will be preferred.

Qualification, Pay-Scale and other requirement are as prescribed by the U.G.C. notification dated 18th July, 2018, Government of Maharashtra Resolution No. MISC-2018/C.R.56/18/UNI-I dt. 08th March 2019, and University of Mumbai Circular No. TASS (CT)/ICD/2018-19/1241 dt. 26th March, 2019 and by those revised from time to time.

The Government Resolution and Circular are available on the website: mu.ac.in.

Applicants who are already employed must send their application through proper channel. Applicants are required to account for breaks, if any, in their academic career.

Candidates belonging to reserved categories should send two Xerox copies of their application along with the attested copy of the Caste Certificate to the Deputy Registrar, Special Cell, University of Mumbai, Mumbai-400 032.

Applications with full details should reach to the **THE PRINCIPAL, NAVKONKAN EDUCATION SOCIETY'S DR. DATAR ARTS, DR.BEHERE SCIENCE, AND SHRI PILUKAKA JOSHI COMMERECE COLLEGE, CHIPLUN, TAL – CHIPLUN, DIST – RATNAGIRI 415605 within 15 days** from the date of publication of this advisement.

This is university approved advertisement.

Sd/-
Principal

Dr. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD

SEARCH COMMITTEE INVITES APPLICATIONS FOR THE POST OF VICE-CHANCELLOR

Dr. Babasaheb Ambedkar Marathwada University is one of the oldest and premier Universities in India, established in the year 1958 and currently incorporated under the Maharashtra Public Universities Act, 2016. The jurisdiction of the University extends over four districts i.e. Aurangabad, Jalna, Beed and Osmanabad.

Applications / Nominations are invited from eminent academicians who fulfill the qualifications and experience prescribed for the post of Vice-Chancellor under Maharashtra Public Universities Act, 2016 and as amended by Maharashtra Act VI of 2023.

Candidates who fulfill the prescribed qualification and experience and are willing to take on this prestigious and challenging assignment may apply online by visiting the link: **vcbamu.nitsri.ac.in.** The link will be active from 20th September 2023. The last date to fill the online applications is 19th October 2023. After submission of online application, the candidates are advised to take out the printout of the application form.

The Hard copy (2 copies) of the application form along with all required self-attested copies of certificates should reach the office of the nodal officer by or before **27th October 2023** on the following Address:

Dr. Janibul Bashir

Department of Information Technology,

National Institute of Technology, Srinagar Hazratbal, Srinagar. PIN - 190006

Email: nodalofficerbamu@nitsri.ac.in

The envelope containing the application/s shall invariably mention the name of the post applied for **"Application for the post of Vice-Chancellor, Dr. Babasaheb Ambedkar Marathwada University, Aurangabad"**

The Detailed advertisement, essential qualifications and experience, other requisite documents and details are available on the website **www.bamu.ac.in** of the Dr. Babasaheb Ambedkar Marathwada University, Aurangabad. & **vcbamu.nitsri.ac.in.** Application received after due date shall not be considered.

Chairman
Search Committee

Date :- 18th September, 2023.

SAHAJEEVAN SHIKSHAN SANSTHA

SHRIMATI INDIRA MAHADEV BEHARAY COLLEGE OF ARTS
SHRIMAN CHANDULAL SHETH COLLEGE OF COMMERCE &
SHRIMATI SHOBHANATAI CHANDULAL SHETH COLLEGE OF SCIENCE
(I.C.S. COLLEGE OF ARTS, COMMERCE AND SCIENCE)
Khed, Dist - Ratnagiri, Pin - 415 709

APPLICATIONS ARE INVITED FOP THE POST OF

PRINCIPAL

FROM THE ACADEMIC YEAR 2023-2024

AIDED

The advertisement is approved subject to the final decision in the Writ Petition No. 12051/ 2015.

The above post is open to all however candidates from any category can apply for the Post

Reservation for women will be as per **University Circular No. BCC/16/74/1998 dated 10" March. 1998. 4% reservation shall be for the persons with disability as per University Circular No. Special Cell/ICC/2019-20/05 dated 05th July, 2019.**

Candidates having knowledge of Marathi will be preferred.

"Qualification, Pay Scales and other requirement are as prescribed by the UGC Notification dated 18th July, 2018, Government of Maharashtra Resolution No. Misc2018/C.R.56/18/UNI-1, dated 8th March, 2019 and University Circular No. TAAS/(CT)/ICD/2018-19/1241, dated 26th March, 2019 and revised from time to time"

The Government Resolution & Circular are available on the website mu.ac.in.

Applicants who are already employed must send their application through Applicants are required to account for breaks, if any in their academic career.

Application with full details should reach the **EXECUTIVE PRESIDENT, SAHAJEEVAN SHIKSHAN SANSTHA, SHRIMATI INDIRA MAHADEV BEHARAY COLLEGE OF ARTS. SHRIMAN CHANDULAL SHETH COLLEGE OF COMMERCE & SHRIMATI SHOBHANATAI CHANDULAL SHETH COLLEGE OF SCIENCE, (I.C.S. COLLEGE OF ARTS, COMMERCE AND SCIENCE) KHED, DIST-RATNAGIRI, PIN - 415 709. within 15 days** from the date of publication of this advertisement. **This is University approved advertisement.**

Sd/-
EXECUTIVE PRESIDENT

Licensed to post without prepayment under WPP No. U(C)-109/2021-23

Postal Regd. No. DL (C)-05/1241/2021-23

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