

भौगोलिक मानांकन प्राप्त अलिबाग मधील पांढऱ्या कांद्याचे विश्लेषण

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अर्थशास्त्र विभाग

(प्रभाकर पाटील एज्युकेशन सोसायटीचे

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प्रस्तावना :

भारत हा कृषीप्रधान देश आहे. भारतीय अर्थव्यवस्थेचा आधार म्हणजे मेहनत करणारे लाखो शेतकरी आहेत. स्वातंत्र्योत्तर काळात भारतीय शेतीच्या विकासाच्या स्वरूपात आणि प्रारूपात बदल झालेला दिसून येतो. जागतिकीकरणानंतर कृषी क्षेत्राला अनेक आव्हानांना तोंड द्यावे लागले. यामधून या क्षेत्राला बाहेर काढण्यासाठी आणि शेतीचा विकास करण्यासाठी शासनाने शेतीसंबंधित अनेक उपाययोजना राबविल्या. त्यामधीलच कृषी शेतमालाबाबत शासनाने मालाचे भौगोलिक मानांकन (नोंदणी आणि संरक्षण) कायदा १९९९, हा १५ सप्टेंबर २००३ पासून अमलात आणला. अलिबाग तालुक्यातील पांढऱ्या कांद्याच्या औषधी गुणधर्मांचा उल्लेख १९८३ सालच्या कुलाबा या राजपत्रात केलेला आढळतो. महाराष्ट्र कृषी विभाग आणि कोकण कृषी विद्यापीठ दापोली यांनी १५ जानेवारी २०१९ मध्ये अर्ज दाखल केल्यानंतर केंद्र सरकारच्या पेटंट विभागाने २९ सप्टेंबर २०२१ मध्ये या कांद्याला भौगोलिक मानांकन प्राप्त झाल्याचे घोषित केले. परिणामी भौगोलिक मानांकन प्राप्त अलिबाग तालुक्याच्या अर्थव्यवस्थेच्या बळकटीकरणाला हे बागायती पिक आर्थिकदृष्ट्या महत्त्वाचे ठरत आहे.

Keywords : भौगोलिक मानांकन, पांढरा कांदा, अलिबाग उद्दिष्ट :

अलिबागमधील कांद्याला भौगोलिक मानांकन प्राप्त होण्याची कारणे, त्याचे वेगळेपण आणि वैशिष्ट्यांचा अभ्यास करणे तसेच पांढऱ्या कांद्याच्या विशेषीकरणातील वाढीचा अभ्यास करणे, हा या शोधनिबंधाचा उद्देश आहे.

शोधनिबंधाची अभ्यास पद्धती:

कांदा पिकाचा अभ्यास करतांना शोधनिबंधात प्राथमिक व दुय्यम स्रोतांचा आधार घेतलेला आहे. पांढऱ्या कांद्याला

भौगोलिक मानांकन प्राप्त होण्यामागची पार्श्वभूमी मांडताना गुणात्मक तसेच कांदा लागवडीखालील क्षेत्र आणि उत्पादनाचे विश्लेषण करण्यासाठी संख्यात्मक पद्धतीचा वापर केलेला आहे.

शोधनिबंधाची मर्यादा :

हा शोधनिबंध अलिबाग तालुक्यापुरताच मर्यादित असून केवळ पांढरा कांदा या बागायती पिकाचेच विश्लेषण यामध्ये केलेले आहे. अलिबाग तालुक्यात पिकविल्या जाणाऱ्या इतर बागायती पिकांचा अभ्यास या शोधनिबंधात केलेला नाही.

गृहितक :

भौगोलिक मानांकन प्रक्रिया सुरु झाल्यानंतर अलिबाग तालुक्यातील कांदा लागवडीखालील क्षेत्रामध्ये आणि कांदा उत्पादनात वाढ होत आहे.

अर्थ :

भौगोलिक मानांकन (GI) एक विशिष्ट नाव किंवा चिन्ह आहे जे विशिष्ट भौगोलिक स्थान किंवा मूळ स्थान (एखादे गाव, शहर, प्रदेश किंवा देश) यांच्याशी संबंधित उत्पादनासाठी वापरले जाते. हे चिन्ह त्या भौगोलिक प्रदेशाचे प्रतिनिधित्व करते.

अलिबाग तालुक्याची पार्श्वभूमी :

कांदा लागवड व-उत्पादनाच्या बाबतीत महाराष्ट्र राज्य हे देशपातळीवरील प्रमुख राज्य म्हणून ओळखले जाते. महाराष्ट्रातील काही जिल्ह्यांमध्ये कांद्याची लागवड मोठ्या प्रमाणात केली जाते. याच कारणास्तव महाराष्ट्र हे कांद्याची ओळख असलेले राज्य म्हणून नावाजलेले आहे. या महाराष्ट्रातील कोकण विभागातील रायगड जिल्ह्यातही कांदा उत्पादन घेतले जाते. परंतु रायगड जिल्ह्याचे प्रमुख व मध्यवर्ती



ठिकाण म्हणून ओळख असणारा अलिबाग तालुका हा पांढरा कांदा उत्पादनासाठी ओळखला जातो. या शहराला पर्यटन व ऐतिहासिक वारसा लाभलेला असून हे शहर औद्योगिकदृष्ट्याही महत्वाचे आहे. तांदूळ हे या तालुक्यातील प्रमुख पिक असले तरी येथील शेतकरी विविध प्रकारच्या पालेभाज्या, कडधान्ये तसेच फळपिकांमध्ये आंबा, कलिंगड, नारळ सुपारी, यांसारखी पिके घेतात. त्यातीलच एक बागायती रब्बी पिक म्हणजे "पांढरा कांदा" आढळतो. अलिबाग तालुका पांढरा कांदा पिकविणारा तालुका म्हणून राज्यात, देशात आता सर्वत्र नावारूपाला येत असून या कांद्याच्या उत्पादनाला मोठ्या प्रमाणात मागणी वाढत असलेली दिसून येते.

कांदा पिकाचे महत्व :

आपल्या आहारामध्ये कांदा या पिकाला अनन्यसाधारण महत्व आहे. अलिबागचा पांढरा कांदा अग्निदीपक, रुचकर, कफोत्सारक, उत्तेजक, मुत्रल, कामोद्दीपक असा बहुगुणी आहे. त्यामध्ये कल्शिम, अल्युमिनिअम, क्युरसिटीन, अ,ब,क जीवनसत्व, गंधक फौस्फोरिक आम्ल, तंतुमय पदार्थ, स्निग्धता असे अनेक घटक आढळतात. पांढऱ्या कांद्यामध्ये औषधी गुणधर्म असल्यामुळे त्याचा उपयोग प्रामुख्याने चेहरा कान्तीयुक्त, सतेज दिसण्यासाठी, चेहऱ्यावरील सुरकुत्या नाहीशा करण्यासाठी, उन्हापासून त्रास कमी करण्यासाठी, केसांची वाढ चांगली होण्यासाठी आणि मुळव्याधीच्या समस्येवर उपाय म्हणून केला जातो.

भौगोलिक मानांकन प्राप्त होण्याची पार्श्वभूमी :

अलिबागचा पांढरा कांदा हा त्याच्या गुण वैशिष्ट्यामुळे आपले वेगळेपण टिकवून आहे. अलिबागच्या मातीमध्ये गंधकाचे प्रमाण आढळून येते. त्यामुळे या मातीत उत्पादित झालेला कांदा हा चवीला रुचकर व औषधी ठरलेला आहे. इतर ठिकाणी पिकणाऱ्या कांद्यापेक्षा हा कांदा अधिक काळ टिकतो, कांद्याला तिखट वास येत नाही आणि कांदा कापताना किंवा खाताना डोळ्यात पाणीदेखील येत नाही. तसेच हा कांदा पिकविताना जैविक खताचा जास्तीत जास्त वापर करून पिकविला जातो. या कारणास्तव तो आरोग्यास लाभदायक ठरतो. या कांद्याला भौगोलिक मानांकन प्राप्त होण्यामध्ये ही कारणे महत्वाची ठरलेली आहेत.

अलिबागच्या पांढऱ्या कांद्याचे वैशिष्ट्य :

पांढऱ्या कांद्याची रोपे तयार करण्यासाठी लागणारे बियाणे शेतकरी विकत न घेता स्वतःच्या शेतात तयार करतात. ते

तयार करण्यासाठी प्रथम मध्यम आकाराच्या कांद्याची निवड करून प्रत्येक कांद्याचा एक तृतीयांश भाग कापला जातो व त्यानंतर एका सरळ रेषेमध्ये कापलेल्या कांद्याची जमिनीमध्ये लागवड केली जाते. लागवड केल्यानंतर कांद्याला पाच ते सहा दिवसात नवीन अंकुर फुटतो. दोन ते तीन महिन्यांनंतर लावलेल्या कांद्याला फूल यायला सुरुवात होते. फुल आल्यानंतर सहा ते सात आठवड्यांमध्ये फुलांमध्ये बी तयार होते. हे तयार झालेले बी दोन ते तीन दिवस कडक उन्हामध्ये तापविले जाते. तापविल्यानंतर पाकळ्यामधून काळ्या रंगाचे बी पाखडून वेगळे केले जाते व हे वेगळे केलेले बी हवाबंद काचेच्या बरणीमध्ये साठविले जाते. बहुतांशी बाजारात विक्री केला जाणारा कांदा अलिबागमधील पांढरा कांदा या नावाने विकला जातो मात्र इतर ठिकाणी मिळणारा पांढरा कांदा आणि अलिबाग मधील पांढरा कांदा यांची तुलना केली असता अलिबागचा कांदा हा वेणीच्या स्वरूपात उपलब्ध असतो. त्यामुळे तो ओळखणे सोपे जाते. मात्र इतर ठिकाणी मिळणारा कांदा हा सुट्या स्वरूपात विक्रीला असतो.

उत्पादन :

अलिबाग तालुक्यातील शेतकरी पारंपारिक पद्धतीने पांढऱ्या कांद्याचे उत्पादन घेतात. कांद्याची लागवड करताना पाण्याचा निचरा होणाऱ्या जमिनीची निवड केली जाते. कांदा लागवडीनंतर वेळी-अवेळी पडणाऱ्या पावसाचे पाणी शेतामध्ये साठणार नाही याची काळजी घेतली जाते. या कांद्याच्या उत्पादनासाठी जमिनीचा सामू ६.५ ते ७.०० दरम्यान असणे आवश्यक आहे. शेतकरी जमिनीची नागरणी करून एक मीटर रुंदीचे आणि त्यांच्या सोयीनुसार लांबीचे गादीवाफे तयार करतात. काही शेतकरी टिकाव किंवा कुदळ या पारंपारिक शेती साधनांचा वापर करून जमिनीची उखळवणी करतात. जमिनीमधील असणारे चौर (खरीप पिकाच्या उत्पादनांतर) बाजूला काढून गादीवाफे तयार करतात. बहुतांश शेतकरी सपाट वाप्यामध्ये कांद्याची लागवड करतात.

कांदा या पिकासाठी थंड हवामान चांगले मानवत असल्याने कांद्याची लागवड प्रामुख्याने हिवाळ्यात म्हणजे रब्बी हंगामात केली जाते. ऑक्टोबर-नोव्हेंबर महिन्यामध्ये रोपे तयार करून नोव्हेंबर-डिसेंबर मध्ये पुनर्लागवड केली जाते. रोपे तयार करतांना जर या रोपांना पावसाचे पाणी लागले तर या रोपांमधून तयार होणाऱ्या कांद्यांचा आकार लहान होतो व हे कांदे दिर्घकाळ टिकत नाहीत. लागवडीसाठी प्रति एकर तीन ते चार किलो बियाणे आवश्यक असतात. रोपांची लागवड करतांना संध्याकाळच्या वेळी किंवा तापमान कमी असताना केली जाते.

या पिकासाठी दिवसाचे तापमान ३० ते ३३° सेल्सिअस आणि रात्रीचे तापमान १७ ते १८° सेल्सिअस असेल तर पिकाला ते चांगले मानवते. कांदा तयार होताना २० ते ३०° सेल्सिअस तर कांदा काढणीच्या काळात ३० ते ३५° सेल्सिअस तापमानाची आवश्यकता असते. रोपे सहा ते सात आठवड्यांची झाल्यानंतर त्यांची लागवड केली जाते. लागवड करतांना रोपे वरून १० से.मी. पर्यंत कापली जातात. आणि नंतर त्याची लागवड केली जाते. हे करण्यामागचे कारण म्हणजे जर ती कापली नाही तर वरून पाने पिवळी पडतात आणि रोपाचा पार मुळांवर पडल्याने रोपांची वाढ झपाट्याने होत नाही.

पाण्याचे व्यवस्थापन करताना जमिनीच्या मगदुरानुसार पाण्याच्या पाळ्या दिल्या जातात. हिवाळ्यामध्ये पाच ते सहा दिवसांच्या अंतराने पाणी दिले जाते

कांदा या पिकावर फुलकिडे, रोप कुरतडणारी आळी, रोप वाटिकेतील मर, करपा, पानावरील काणी (स्थानिक शब्द इत्यादी) आणि केवडा या रोगांचा प्रादुर्भाव होतो. फुलकिडे आणि त्यांची पिढे पाने खरवडतात आणि त्यातून येणारा रस पिकात पारिणामी पानांवर पांढुरके चट्टे पडतात. करपा रोगामध्ये पानावर पिवळसर पणा येऊन पाने निस्तेज होतात. गोड्या रोगामध्ये वरून पात करपते आणि कांद्याची वाढ खुंटते, तर केवडा रोगामध्ये पानावर फिकट हिरवट-पिवळसर चट्टे दिसतात आणि पुढचे शेंडे जळतात. या रोगांच्या नियंत्रणासाठी क्लिन्क्लोराइड, मॅन्कोझेब, डायफेनकोनेझोल अशा घटकांचा वापर असणारी औषधांची फवारणी केली जाते.

अलिबाग मधील कांद्याचे पीक रोप लागवडीनंतर ७० ते ७५ दिवसांमध्ये काढणीस तयार होतात. कांदा काढणी अगोदर २० ते २५ दिवस पाणी बंद केले जाते. परिणामी कांदा लवकर तयार होतो, कांद्याचा सड कमी होतो. जर कांद्यात ओलावा जास्त तर कांदा लवकर खराब होतो आणि माना जाड होत नाही. या कारणांमुळे देखील कांदा जास्त दिवस टिकतो. कांद्याची काढणी केल्यानंतर कांदा पात सुकविण्यासाठी कांदा २५ ते ३० दिवस उन्हात ठेवली जाते. कांदा जमिनीवर लावण्याची वाळवी सारख्या कीटकांचा प्रादुर्भाव होऊ नये म्हणून त्या जमीन पाळा पाचोळा व गवताने भाजून घेतली जाते. कांद्याच्या जमिनीवर पारंपारिक पद्धतीने राखेचा वापर करून कांद्याची पात सुकविली जाते. कांद्याची पात सुकविताना कांद्याच्या उतरण्यासाठी ऑडक्यावर पाती ठेवताना कांद्याची पात राहिल व कांदा खाली राहिल अशा पद्धतीने कांद्याची आकाराचे साचे तयार केले जातात. हे करतांना कांद्याची पात राहिल नाहीत याची दक्षता घेतली जाते. कांद्याच्या

पातीमधील पाण्याचा अंश २० ते २५ टक्क्यां दरम्यान राहिला असताना त्याच्या वेण्या विणल्या जातात. दोन वेण्यांमध्ये साधारणपणे ८०-९० कांद्याची संख्या असते. सुकवातीला कांदा विक्रीस आल्यानंतर एका माळेच्या जोडीचे मूल्य रु.३००-३५० असते तर आकाराने मोठ्या कांद्याच्या माळेची जोडी रु. २००-२५० ने तर लहान आकाराच्या कांद्याच्या माळेची जोडीची विक्री रु.१५०-२०० ने केली जाते. पांढरा कांदा लागवडीखालील क्षेत्र आणि उत्पादनाचे तक्त्यावरून विश्लेषण पुढीलप्रमाणे.

तक्ता क्र.१

पांढरा कांदा लागवडीखालील क्षेत्र आणि उत्पादन

अ. क्र.	वर्ष	लागवडीखालील क्षेत्र (हेक्टर मध्ये)	उत्पादन (मे.टन)
०१	२०१९-२०	११६.९	१४०२
०२	२०२०-२१	२२३.०५	३३४५
०३	२०२१-२२	२२१.९	३६४८
०४	२०२२-२३	२२३.४	३७९७

संदर्भ : तालुका कृषी अधिकारी अलिबाग

विश्लेषण :

वरील तक्त्यामध्ये दर्शविल्याप्रमाणे सन २०१९-२० मध्ये कांदा लागवडीखालील क्षेत्र ११६.९ हे. इतके होते मात्र या वर्षात जेव्हा कांद्याच्या भौगोलिक मानांकनाची प्रक्रिया सुरु झाल्यानंतर पुढच्याच वर्षी लागवडीखालील क्षेत्रात १०६.६ हेक्टर वाढ झाल्याचे निदर्शनास येते. कांद्यापासून मिळणाऱ्या उत्पादनाचा विचार करता सन २०१९-२० ते २०२२-२३ या चार वर्षांची तुलना करता प्रती वर्षी पांढरा कांदा उत्पादन वाढीत सातत्य असल्याचे दिसून येते. २०१९-२० आणि २०२०-२१ या दोन वर्षांची तुलना करता २०२०-२१ मध्ये कांदा उत्पादनात १,९४३ मे.टन इतकी सर्वाधिक वाढ झालेली दिसून येते. या तक्त्यावरून भौगोलिक मानांकन प्रक्रिया सुरु झाल्यापासून अलिबाग तालुक्यात कांदा लागवडीखालील क्षेत्रामध्ये आणि या पिकाच्या उत्पादनात वाढ होत आहे, हे गृहितक सिद्ध झालेले दिसून येते.

फायदे :

कांद्याच्या उत्पादनांतर त्यांची वेणी विणून माळ तयार केली जाते. शेतकरी हे कौशल्य प्राप्त असणाऱ्या व्यक्तींना



मजुरीवर (दर दिवशी रु. ३००) घेऊन काम पूर्ण करून घेतात. यामधून स्थानिक स्त्रियांना रोजगार प्राप्त होतो. परीणामी स्त्रियांच्या सशाक्तीकरणात हे उत्पादन महत्वाचे ठरत आहे. कांद्याच्या आकारानुसार या माळेची किंमत ठरविली जाते. अलिबाग मधील शेतकऱ्यांचे तांदूळ हे प्रमुख पिक आहे तर कांदा हे दुय्यम पिक असल्याने शेतकऱ्यांच्या उत्पन्नात वाढ होत आहे. त्यामुळे शेतकऱ्यांच्या राहणीमानाचा दर्जा उंचावण्यास हे उत्पादन महत्वाचे ठरत आहे. अलिबाग शहराला पर्यटनाची पार्श्वभूमी असल्याने पर्यटकांकडून आणि अलिबागचे वैशिष्ट्य ठरलेला पांढरा कांदा भेटी देण्यासाठी वापरत असल्याने या कांदा उत्पादनाची मागणी वाढविण्यामध्ये भौगोलिक मानांकनाची भूमिका महत्वाची ठरत आहे. स्थानिक शेतकरी कांदा विक्री ही रस्त्याच्या दुतर्फा, स्थानिक बाजारात, कांदा संघात करतात किंवा व्यापारी त्यांच्यापर्यंत पोहोचतात. त्यामुळे केवळ रस्त्यापर्यंत कांदा उत्पादन वाहतूकीचा खर्च शेतकऱ्यांना येतो. या सर्व कारणांमुळे कांदा उत्पादनाची आर्थिक उलाढाल वाढत आहे.

संधी :

भौगोलिक मानांकन प्राप्त झाल्यामुळे कांद्याला जागतिक बाजारपेठ मिळेल आणि कांदा उत्पादनाची निर्यात वाढून देशाला परकीय चलन मिळविण्याची संधी शेतकऱ्यांसमोर उभी ठाकलेली आहे.

निष्कर्ष :

१. अलिबाग तालुक्यात कांदा पिकाची लागवड रब्बी हंगामात केली जाते.
२. भौगोलिक मानांकन मिळाल्याने अलिबाग तालुक्यातील शेतकरी कांदा उत्पादनाकडे व्यापाराच्या दृष्टीकोनातून पाहू लागलेले आहेत.
३. भौगोलिक मानांकन प्रक्रियेनंतर कांदा लागवडीखालील क्षेत्रात वाढ होत आहे.
४. भौगोलिक मानांकन प्रक्रियेनंतर कांदा उत्पादनात वाढ होत आहे.
५. कांदा विक्रीसाठी दुकान, गाळा, विक्रीची वेगळी व्यवस्था न करता स्थानिक विक्रेते याची विक्री रस्त्याच्या दुतर्फा

करत असल्याने गुंतवणुकीवरील खर्च कमी होऊन त्यांना निव्वळ नफा प्राप्त होत आहे.

समारोप

अलिबागच्या या पांढऱ्या कांद्याला पर्यटकांकडून तर मागणी आहेच पण इतर शहरांमधूनही कांद्याच्या मागणीत वाढ होत आहे. प्रामुख्याने मुंबई, पुण्याचे व्यापारी शेतकऱ्यांकडे येऊन कांदा खरेदी करून त्यांच्या बाजारात कांद्याची विक्री करतात तर काही शेतकरी स्थानिक बाजारात देखील त्याची विक्री करतात. अलिबाग तालुक्यामधील कार्ले, रुळे, निगडे, वाडगाव, नेहुली, सागाव, खंडाळे, तळवली इ. गावांमध्ये पांढऱ्या कांद्याची लागवड केली जाते. कांदा उत्पादनाकडे शेतकरी व्यापारी दृष्टीकोनातून पाहू लागलेले आहेत. यासाठी कांदा उत्पादक शेतकरी संघटीत होत आहेत. कांदा संघामार्फत कांद्याचे विशेषीकरण करण्याचे प्रयत्न सुरु आहेत. जेणेकरून कांदा उत्पादक शेतकरी आर्थिकदृष्ट्या सक्षम होईल आणि अलिबागच्या कांद्याला जागतिक बाजारपेठ मिळेल. अलिबागच्या कांद्याला मिळालेले भौगोलिक मानांकन हे व्यापाराच्या दिशेने पडलेले एक महत्वाचे पाऊलच म्हणावे लागेल.

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INNOVATION IN TEACHING LEARNING PROCESS

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ABSTRACT

The innovation word comes from the Latin word innovate which means "to create or develop something new or to change something or to alter or to add something new". In the field of education, innovation means developing something new to make a healthier learning environment. In the teaching-learning process, the meaning is to develop new methods, personalized learning, project-based learning, asking open-ended questions, introducing ICT tools, brainstorming sessions etc.

The National Education Policy (NEP) 2023 in India heralds a transformative shift in the education landscape, placing innovation at the forefront of the teaching-learning process. Here I discuss some key points regarding innovation in education as outlined by NEP 2023 which reflect the teaching-learning process.

Keywords: Innovation, Latin, alternation, teaching-learning, transformative, landscape, regarding, reflect.

INTRODUCTION

Innovation in teaching and learning is the creative introduction of new ideas, methods, or technologies to improve the quality and effectiveness of the educational experience for students.

In today's rapidly changing educational landscape, the concept of innovation in teaching and learning has gained paramount importance. As traditional teaching methods are continuously being reevaluated to meet the evolving needs of students and the demands of the modern world, innovation emerges as a crucial catalyst for transformation. This exploration delves into the diverse facets of innovation in education, from novel teaching techniques to cutting-edge technologies, all aimed at enhancing the quality and effectiveness of the teaching and learning process.

New Pedagogical Approaches: Innovations in teaching-learning may involve adopting new pedagogical approaches, such as active learning, problem-based learning, flipped classrooms, or project-based learning. These methods encourage students to be more actively engaged in the learning process.

Multidisciplinary and Flexibility: It allows students to choose subjects across streams and fosters cross-disciplinary innovation. The flexible curriculum empowers learners to explore diverse knowledge areas. It allows students to choose the subjects concerning their interest which help to make them more creative in their respective field.

Technology Integration/ Usage of ICT Tools: ICT tools, such as computers, tablets, and interactive whiteboards, provide access to a wide range of multimedia resources like videos, animations, and simulations. These resources make learning more engaging and interactive, helping students grasp complex concepts more easily. ICT tools can be used to create personalized learning experiences. Adaptive learning software can assess individual student progress and tailor lessons to their needs, helping students learn at their own pace. Online tools, such as video conferencing, collaborative documents, and learning management systems, enable students to work together on projects, even if they are physically distant. This promotes teamwork and cross-cultural collaboration. The policy emphasizes the integration of technology in education, enabling digital resources, online platforms, and e-learning tools. This facilitates personalized and interactive learning experiences.

Holistic Assessment: It includes continuous evaluation of critical thinking, problem-solving, brainstorming sessions, organizing quizzes on the topics related to the syllabus & creativity. This innovation redefines the assessment paradigm.

Teacher Empowerment: The policy recognizes the pivotal role of educators in fostering innovation. It promotes continuous professional development, training, and pedagogical innovation among teachers. By arranging faculty development lectures, seminars or national and international conferences to foster the teaching process. Online courses, webinars, and forums provide opportunities for teachers to improve their skills and stay updated on the latest pedagogical trends.

Experiential Learning: Through internships, apprenticeships, field visits and practical experiences. This hands-on approach connects classroom learning with real-world challenges. This technique helps students to be most productive in nature and helps them to be future-ready or job-ready.

Global Exposure: National or International or institutional level collaboration, offering students exposure to global best practices and diverse cultural perspectives, thereby enhancing innovation through diverse experiences. With the help of collaboration, we can provide different types of courses related to their field of interest so that they can boost themselves more in their field. With the help of collaboration, we can also provide scholarships to needy students which help them in their academics.

Inclusivity: Addressing the unique learning needs of all students, fostering innovation in teaching methods to cater to diverse abilities. Identifying student's needs is necessary to develop new teaching methods. It provides an effective and healthy environment to the students which increases their learning experience. We can break down the barriers to learning and create a better environment for learning. Teachers can innovate new teaching methods for the students for their better understanding. We can prepare students for a diverse and interconnected world. By providing fair opportunities and resources among the students so that each individual has an equal chance to succeed. It aims to ensure that every student, regardless of their differences, feels welcome, supported, and able to fully participate in the learning experience.

Cultural Activity: The cultural activity enhances innovative teaching and learning by promoting cultural diversity, offering resources, and organizing events that expose students to various cultures. Through interdisciplinary studies, creative arts, and entrepreneurship opportunities, it encourages creative thinking and problem-solving ability. Additionally, it fosters global perspectives and cross-cultural communication skills, preparing students to approach projects and challenges innovatively in our interconnected world. For some students, involvement in cultural activities can lead to career opportunities in fields like arts, entertainment, cultural preservation, and education. Performing in front of an audience, whether it's a play, dance performance, or art exhibition, can boost students' self-confidence and self-esteem. Overcoming stage fright and receiving positive feedback can be empowering. In some cases, cultural activities involve the preservation and celebration of one's cultural heritage. This can help students maintain a strong connection to their roots and identity.

Overall, cultural activities enrich the educational experience by providing a holistic approach to learning that goes beyond textbooks and traditional classroom settings. They nurture a well-rounded individual who is culturally sensitive, creative, and equipped with a diverse skill set.

Sports-related activity: Playing sports at the institutional level the inter-collegiate level the university level or the inter-university level develops good physical as well as mental health. It teaches students to be disciplined and on time. It develops teamwork and leadership among the students. We can provide scholarships for those students that will help them in their academics. Students can develop a network of friends and mentors which will help them to provide future opportunities to represent themselves as well as the institute or college at different levels.

Research Orientation: A research-oriented teaching environment, fostering innovation by promoting inquiry-based learning, writing reviews on articles, literature writing, conducting research paper reading in various classrooms and the creation of a vibrant research ecosystem. Completing research projects can boost students' confidence in their abilities. This confidence can extend to other academic and personal pursuits. Some research projects have real-world applications. Students may contribute to solving practical problems or advancing scientific knowledge. Through research, students have opportunities to collaborate with professors, peers, and professionals in their field of interest, expanding their networks and learning from others. Research experience is valuable for students planning to pursue graduate or professional studies. It demonstrates their commitment to academic inquiry and their ability to conduct independent research. Research often involves finding novel solutions to problems. Students are encouraged to think creatively and explore new ideas, fostering innovation.

Entrepreneurship and Skills: Entrepreneurship and skill development, equipping students with the capacity to innovate, create, and adapt to changing economic landscapes. Entrepreneurship encourages students to think outside the box and come up with creative solutions to problems. They learn to innovate and find unique ways to address challenges. Entrepreneurship involves taking calculated risks. Students learn how to assess risks, make decisions under uncertainty, and manage potential outcomes effectively. Understanding finances is crucial for entrepreneurs. Students learn about budgeting, financial planning, revenue generation, and profit analysis. Entrepreneurship education cultivates leadership qualities as students take ownership of their projects, lead teams, and make strategic decisions. Successfully planning and executing entrepreneurial projects can boost students' self-confidence, empowering them to believe in their capabilities. Entrepreneurship comes with ups and downs. Students learn resilience and perseverance as they navigate challenges, setbacks, and failures. Entrepreneurial education introduces students to market research, helping them understand customer needs, preferences, and trends. Entrepreneurship has the potential to create job opportunities for others. Students learn

about the impact of their ventures on the economy and society. Entrepreneurial education fosters a mindset of continuous learning, adaptability, and a willingness to embrace new challenges.

CONCLUSION

Innovation in the teaching and learning process involves the thoughtful innovation of new and creative approaches to enhance educational experiences and outcomes for both educators and students. It encloses a wide range of strategies, technologies, methodologies and practices that aim to address the evolving needs of learners in a rapidly changing world. As education continues to adapt to modern challenges and opportunities, innovation becomes a crucial factor in ensuring that teaching and learning remain effective, engaging and relevant. By embracing innovation, educational institutions can unlock new avenues for knowledge propagation, skill enhancement and personal growth.

Innovation in teaching-learning can make academicians adapt to change, increase the engagement of students through various activities, and personalize learning which helps students strengthen their interest in their field. With the help of global reach learning or using ICT tools we can introduce online learning, virtual classrooms, digital collaboration tools to break down geographical barriers, allowing students and educators from around the world to connect and share knowledge.

The National Education Policy 2023 in India positions innovation as the driving force behind a dynamic and student-centric teaching-learning process. The transformative potential of NEP 2023, shaping the future of education in India with innovation as its cornerstone.

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Carbon Footprint Reduction in daily travel by Walking practice: One of the form of behavior towards sustainability

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Abstract:

This study was conducted to analyse the reduction of the carbon footprint contributed by the individual transportation for daily travel by emphasizing on using no means of transportation. I by myself is the target individual for this study. Hereby I reported my daily travel behaviour and fuel consumption while roaming around my house and workplace. The fuel consumption data from the daily travel were used to calculate each individual's carbon emission level. The means use for tracking daily steps and calculating Carbon Footprint on individual level includes use of Impact app and Cool The Globe mobile app which is used worldwide. After the analysis, the value of carbon emissions was revealed. Next, I was further encouraged to avoid any means of transport for short distance upto 3 – 4 km. The analysis of data recorded showed that there was a significant difference in fuel consumption if I used to travel by using any mode of travelling for roaming around. This indicates that the our daily single step can reduce carbon footprint considerably contributing majorly towards Environmental Sustainability.

Key words: Carbon Footprint, Environmental Sustainability, Impact application , Cool The Globe application

Introduction -

One of the major sector that contributes to the Greenhouse Gases (GHGs) emissions is transportation. In terms of carbon footprint, transportation is among the major contributors of high carbon intensity in the urban as well as in rural area. Climate change is now a days major issue of our concern. It has reflected in long term shift in temperature and weather pattern. All over the world climate change is reflected in terms of heat wave, floods, severe storms, droughts conditions, loss of floral and Faunal species, food scarcity, warming and rising ocean level. To fight against these life threatening implications effective measures are implemented since two decades. These efforts so taken are by the community who is either ecologist, environmentalists, enthusiasts only thus are to the limited extent.

One of the major cause of climate change is increasing temperature level day by day. This is due to greenhouse gas and carbon emissions. The Kyoto protocol covers six categories of GHG emissions: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride

(SF₆). [01] Among all these greenhouse gases CO₂ is the gas which emitted globally with largest proportion [02]. GHG have ability to trap solar radiations which warms up Earth atmosphere. Anthropogenic activities continues to emit greenhouse gases, the global temperature is rising and thus leading to Extreme climate change. [03] Thus efforts in promoting awareness for carbon footprint reduction cab be achieved by adopting an individual consistent walking practice for nearby transportation needs. It also provides opportunity for exercise and keeps health related risks away.

Objective -

The aim of this study is to explore community based sustainable behavior like walking can contribute in reducing the carbon emissions considerably thus ultimately preventing the climate change.

This study helped to look for maintaining consistency in sustainable practices like walking. Thus the period of almost 24 months was taken into consideration and daily steps were counted with the help of mobile app. The daily travelling journey includes to and fro between home to workplace and sometimes to marketplace.

Methodology -

In this study, I was the target participant. Study was based on my consistent walking practice to reach workplace. Observations were noted down for period of minimum 2 years. To count daily steps Impact mobile app was used. This app not only count daily steps. This app pays monetary help to registered NGO against your steps. Corporate partners fund the NGO projects with their corporate social responsibility (CSR) budget. A cause campaign goes live on the app as soon as a charity amount is placed by the company. Once the cause is live, you just walk and jog every day to achieve the charity goal. When the caused is 100% completion funding agency sends money to NGO. NGO shares the project report after the usage of the fund. With the help of this app I was able to count my daily steps intern the distance travelled in kilometer and the money collected against it was utilized for social cause.

The second app which was utilized was "Cool The Globe" app is currently used by 110

countries. Users uptill now are 46086 and analysis done with the help of this app says 10 lacs kg of GHG emission is avoided uptill nw. Pune based girl Prachi Shevgaonkar ,the designer of this app got shortlisted to attend United Nations Climate Change conference COP 27 in 2022 at Egypt for her work in initiating impactful climate actions. This app helped me to calculate my own carbon footprint with the help of data from Impact app i. e. distance travelled by me every day to reach the destination. It calculates your carbon footprint by considering where is factors like usage of nonrenewable fossil fuels like petrol,diesel, CNG, LPG, fuel oil, coal etc. With use of this too mobile apps daily I was able to calculate my daily carbon footprint if I supposed to travel by two wheeler or four wheeler running on either Petrol diesel or CNG.

Observations:

Daily steps were counted with the help of "Impact app" along with saved carbon emission calculated with the help of "Cool the Globe app".

Table No. 1 Month wise Daily steps count along with distance travelled in km.

Sr. No.	Assessment Period	Month wise total no. of Steps	Dist. Travelled in km
1	Jan. 2022	152570	115.18
2	Feb. 2022	141413	106.77
3	Mar-22	80718	61.33
4	Apr-22	185266	140.06
5	May-22	214328	163.26
6	Jun-22	205450	161.63
7	Jul-22	157092	125.5
8	Aug-22	195852	156.8
9	Sep. 2022	127113	100.5
10	Oct. 2022	68891	54.1
11	Nov. 2022	134133	106.4
12	Dec. 2022	100507	78.8
13	Jan. 2023	122695	98.9
14	Feb.2023	171097	138.9
15	Mar-23	140710	113.6
16	Apr-23	109330	86.3
17	May-23	114410	99.1
18	Jun-23	141977	115.2
19	Jul-23	75780	62.6
20	Aug-23	197522	171.6
21	Sep. 2023	145497	119.2
22	Oct. 2023	203809	167
23	Nov. 2023	202163	162.6
24	Dec. till date	109970	90.3
25	Total	3498293	2795.63

Result and Analysis:

* GHG emission factor for Petrol: 2.297 kg CO₂ eq. /lit

\$ GHG emission factor for CNG: 2.72 kg CO₂ eq. /kg

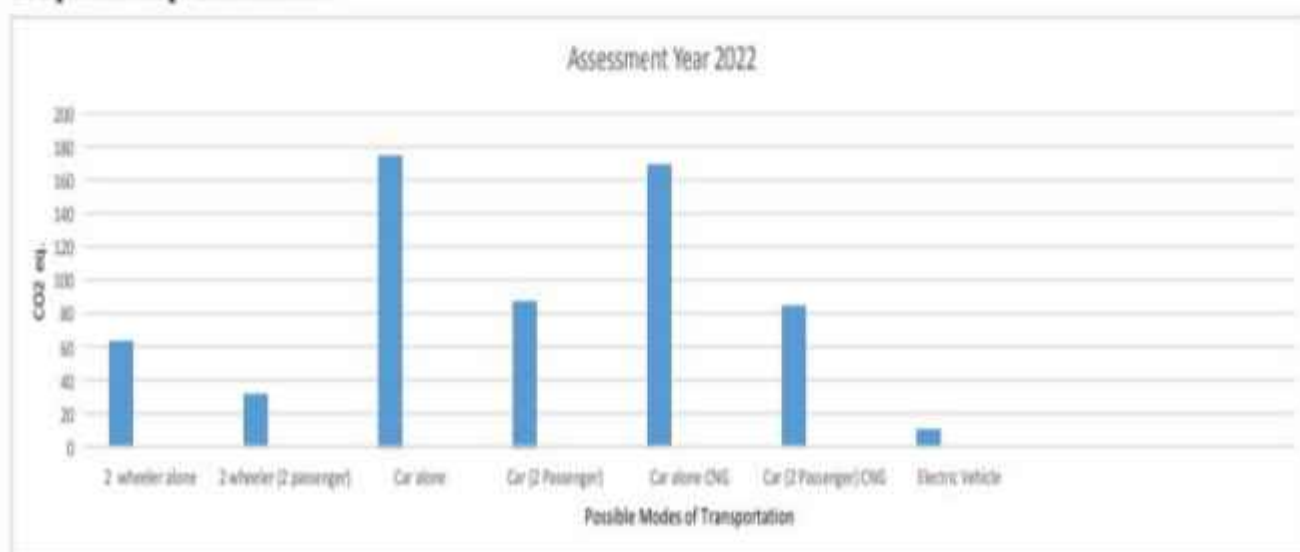
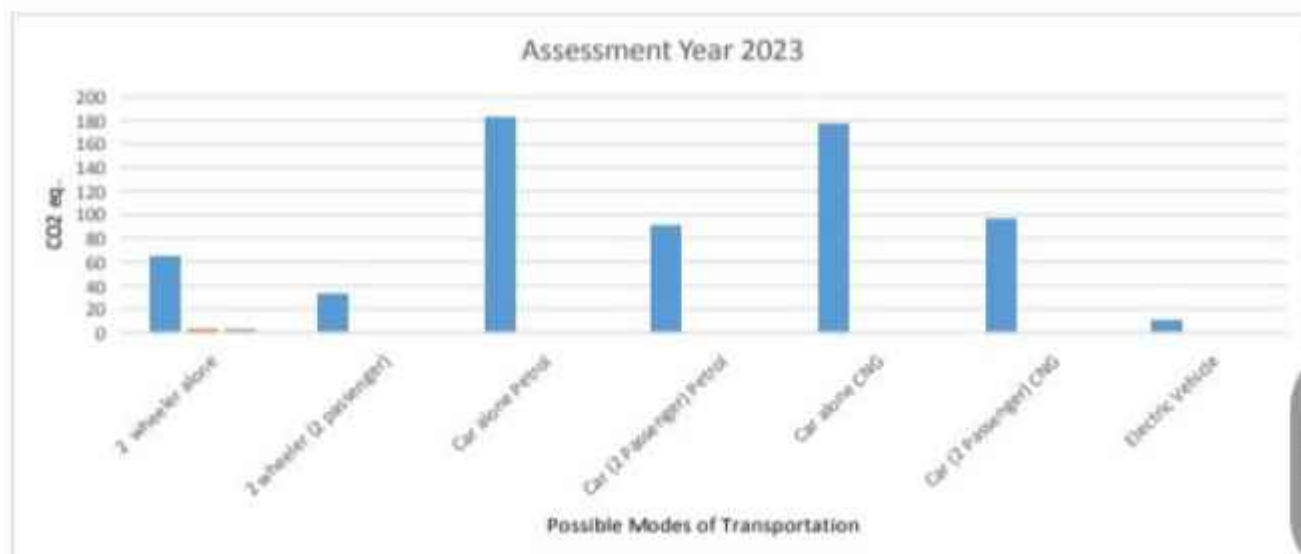
@ GHG emission from Electricity: 0.72 kg CO₂ eq. /kWh

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Table No. 2. Possible modes of transportation with amount of CO₂ eq. Released

Possible Modes of transportation	Assessment Year 2022	Assessment Year 2023
Dist. Travelled	1370.33	1425.30
2 wheeler alone *(Mileage 50 km/lit)	62.94	65.46
2 wheeler (2 passenger) *(Mileage 50 km/lit)	31.47	32.73
Car alone * (Mileage 18 km/lit)	174.82	181.84
Car 2 Passenger * (Mileage 18 km/lit)	87.41	90.92
Car alone \$ (Mileage 22 km/lit)	169.38	176.18
Car 2 Passenger \$ (Mileage 22 km/lit)	84.69	96.9
Electric Vehicle (Irrespective of Carbon emission during manufacturing) @ (Mileage 100 kWh)	9.86	10.26

Graphical Representation :

a. Amount of CO₂ kg eq. released with possible modes of transportation during assessment year 2022b. Amount of CO₂ kg eq. released with possible modes of transportation during assessment year 2022

Impact and Cool the Globe Application Interface

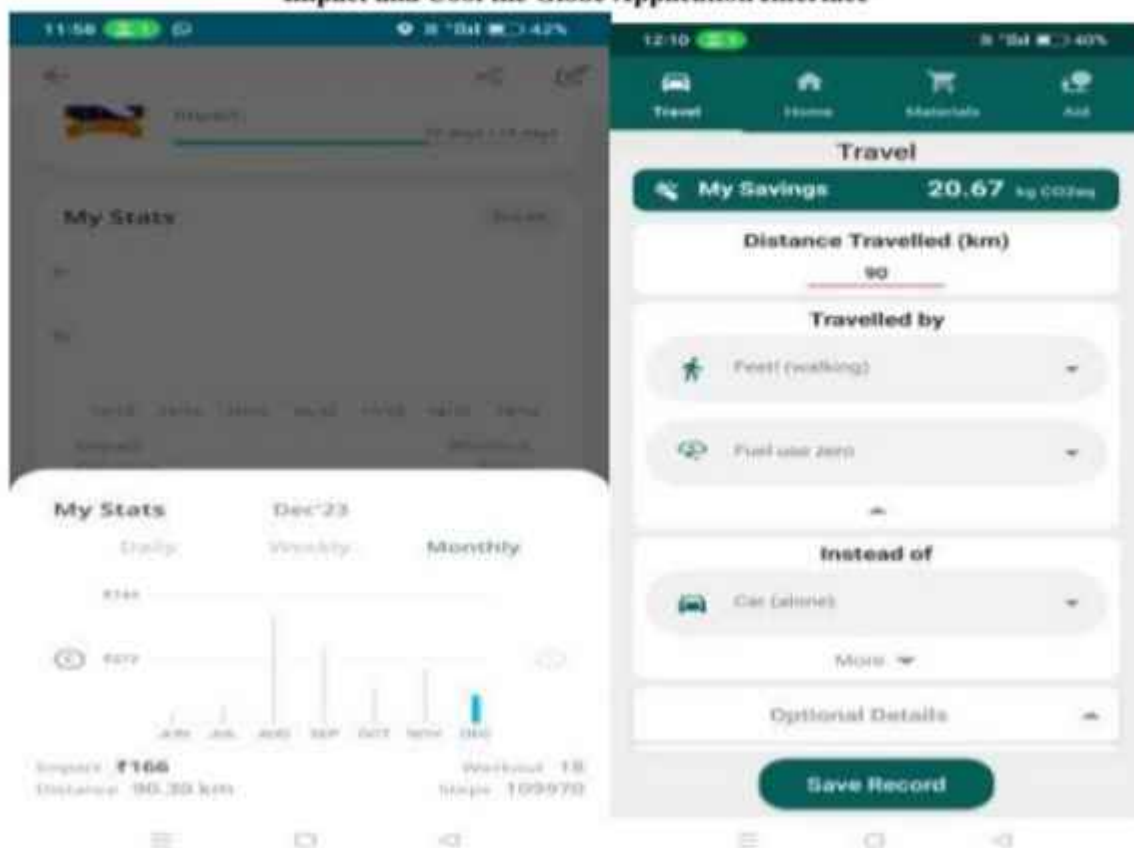
**Conclusion -**

Table no. 1 and 2 along with graphical representations a and b shows that your single step daily can minimize individual's carbon footprint. As an individual we can switch to low emission lifestyle. Global goal is to reduce CO2 emissions to zero by 2050. Current CO2 emissions are around 35 billion tonnes.

For travelling to short distance by implementing consistent walking practice will be one of the solution to reduce carbon emissions. But limitation is the lack of awareness and negligence. The monetary amount donated by Impact app gave me an opportunity to contribute for noble social cause. This study was rather enlightening and gave me dual satisfaction as I was able to avoid carbon emission along with keeping myself fit and fine by consistent walking practice.

So also use of public transport, carpooling , bike pooling can be the other ways by which traffic and other pollution related issues can be resolved to certain extent.

Thus it is hereby requested that such consistent walking practice should be adopted to live healthy and pollution free lifestyle.

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