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Editorial.....

It is heartening to note that our journal is able to sustain the enthusiasm and covering various facets of knowledge. It is our hope that IJMER would continue to live up to its fullest expectations savoring the thoughts of the intellectuals associated with its functioning .Our progress is steady and we are in a position now to receive evaluate and publish as many articles as we can. The response from the academicians and scholars is excellent and we are proud to acknowledge this stimulating aspect.

The writers with their rich research experience in the academic fields are contributing excellently and making IJMER march to progress as envisaged. The interdisciplinary topics bring in a spirit of immense participation enabling us to understand the relations in the growing competitive world. Our endeavour will be to keep IJMER as a perfect tool in making all its participants to work to unity with their thoughts and action.

The Editor thanks one and all for their input towards the growth of the **Knowledge Based Society**. All of us together are making continues efforts to make our predictions true in making IJMER, a Journal of Repute

Dr.K.Victor Babu
Editor-in-Chief

**SOCIAL SCIENCES, HUMANITIES, COMMERCE & MANAGEMENT, ENGINEERING &
TECHNOLOGY, MEDICINE, SCIENCES, ART & DEVELOPMENT STUDIES, LAW**

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संस्कृतवाङ्मयेषु मनुष्येतरप्राणीनां प्रकृतस्वरूपचिन्तनम् - एका समीक्षा

ड. दिलीपकुमारपण्डा

सहयोग्यध्यापकः

संस्कृतविभागः

घाटलरबीन्द्रशतवार्षिकी महाविद्यालयः

पश्चिमवङ्गः

भारतवर्षः

भूमिका :

भारतीयसंस्कृतेः सूतिकागारं तथा ज्ञानसाधनायाः पूतपीठं रामायणं महाभारतञ्चेति संस्कृतमहाकाव्यद्वयम्। सुदूरातीते कस्मिन् सुमङ्गलक्षणे वाल्मीकेः व्यासस्य च समालोकिता धीशक्तिः प्रकाशिता बभूव, अद्यापि तत् वितर्कधूमैः समाकीर्णम् । महाकाव्यद्वयस्यास्य प्रयासैककः अद्य निखिलविश्वस्यानुकरणं तथा अनुसरणस्थलम्।

चरित्रविचारः

प्राचीनत्वस्य निकषेण परीक्षितं रामायणं विचित्रचरित्राणां सावलीलविचरणक्षेत्रम्, यत्र वानरसैन्याः श्लाघ्यासनं प्राप्ताः, यतः ते रामायणस्य सार्वजनीनत्वे हेतुविशेषाः।

प्राचीनकालात् अद्यावधि रामायणेषु वर्णितवानरानां स्वरूपविषये मानवसमाजे वद्वचिन्तनमेकं वर्तमानं यत्, ते वानराः लाङ्गुलसमन्वितवन्त्यजन्तुविशेषाः, यतु न वास्तवसम्मतम्। रामायणस्थाः राममित्राः वानराः न पशुविशेषाः, परन्तु तत्काले किष्किन्धाधिवासिनः वानरेति नामकाः मनुष्यगोत्रीयाः प्रजातिविशेषाः आसन् । अपि च, तेषु वर्णितेषु चरित्रेषु गन्धर्व-यक्ष-रक्ष-किन्नर-नाग-सुपर्ण प्रभृतयोऽपि न केवलं मनुष्याः, मनुष्येषु श्रेष्ठगुणान्विताः बभूवुः। समीक्ष्यं रामायणम्, महाभारतम्, शतपथब्राह्मणम्, मार्कण्डेयपुराणमवलम्ब्य च आलोचितास्ति।

रामायणविरचनकाले किष्किन्ध्यायामवस्थितेषु वानरेषु वाली-सुग्रीव-हनुमान-नल-नील-सुषेणादयः प्रख्याताः। सर्वाग्रे एतेषां प्रमुखवानराणां किञ्चित् परिज्ञानमावश्यकम्, येन वैज्ञानिकं तथा सामाजिकसत्यमेकं समुद्घाटितं भविष्यति।

वाली – इन्द्र-ऋक्षरजयोः पुत्रोऽयम्, यस्य पत्नी तारा पुत्रश्चाङ्गदः। मायावीति नामकेनासुरेण सह मानवीनार्यैकार्थं विवादः संघटितवान्। वाली विश्वकर्माकृतस्य किष्किन्ध्यापुर्याः राजा बभूव।

सुग्रीवः – सूर्यपुत्रस्य सुग्रीवस्य पत्नी मानवी रुमा। अभिषेककाले रामेन सुग्रीवं मनिविग्रहकाञ्चनकण्ठहारैकः प्रदत्तः।

हनुमानः – अस्योत्पत्तिविषये मतानैकमस्ति। तन्मध्ये एवमालोचितं यत्, पवनदेवाञ्जनयोः पुत्रोऽयम्, यः केवलं अर्धाधिकद्विदिवसे सूर्यं निकषा वेदं षडदर्शनञ्चाधीतवान्, तदनन्तरञ्च किष्किन्ध्यायां सुग्रीवस्यामात्यपदमलञ्चकार।

नलः – अयं विश्वकर्मातनयः प्रख्यातः स्थपत्येकः, यः सेतुवन्धनपरिकल्पनञ्चकार।

नीलः – अग्नेरंशजः सुग्रीवस्य च मित्रोऽयम्।

सुषेणः – वरुणदेवांशजः वालीपत्नी तारायाः पिता अयम्। अन्यमते तु सुषेणः धर्मपुत्रः वैद्यशास्त्रे च सुपण्डितः, यः रामरावणयोः युद्धाहतानां चिकित्सां तदा शक्तिशेलेनाहतलक्ष्मणस्यापि आरोग्यदानं चकारः।

अतः औत्पत्तिकविचारे वैज्ञानिकदृष्ट्या च एवं वक्तुं पारयामि यत्, देवैरसजः देवांशज वा कदापि वन्यपशुः न भवेत्, यतः उक्तदेवैः सह शाखामृगानां सहवासमचिन्तनीयम्। अतः किष्किन्ध्यानिवासिनः सर्वशास्त्राभिज्ञाः सुपण्डिताः वानराः कदापि निर्वाकाः वन्यजन्तवः न भवेयुः।

द्वितीयतः वानरानामेतेषां पाण्डितस्य वाचनपारिपाट्यस्य चोदाहरणं रामायणेषु सुनिवेशितम्। यथा –

क) किष्किन्ध्याकाण्डस्य द्वितीयसर्गे रामलक्ष्मणौ दृष्ट्वा सुग्रीवेन मन्त्रिभिः सह यादृशी मन्त्रणा कृता, रामादयस्यागमनकारणानुसन्धानार्थञ्च नियुक्तान् चारान् यत् निर्दिश्यते, तेनावश्यमेव वक्तुं समर्थः यत्, सुग्रीवोऽयं न केवलं नररूपी, राजनीतिशास्त्रेऽपि अतीव विशारदोऽयम्। पुनः तेन हनुमानेति अमात्यः निर्दिश्यते यत्, सर्वाग्रे आकारेङ्गितैः वचनविनिमयैश्च तौ विज्ञातव्यौ। यदि तौ हृष्टचित्तौ भवेतां, तर्हि प्रशंसापूर्वकं तयोः हृदये सुग्रीवं प्रति प्रतीत्युत्पादनं कर्तव्यम्—

‘तौ त्वया प्राकृतेनेव गत्वा ज्ञेयौ प्लवङ्गम्।
इङ्गितानां प्रकारैश्च रूपव्याभषणेन च॥
लक्षयस्व तयोर्भावं प्रहृष्टमनसौ यदि।
विश्वासयन् प्रशंसाभिरिङ्गितैश्च पुनः पुनः॥
ममैवाभिमुखं स्थित्वा प-च्छ त्वं परिपुंगवः।

प्रयोजनं प्रवेशस्य वनस्यास्य धनुर्धरौ॥’ (किष्किन्ध्याकाण्डम् -२य सर्गः -२४-२६ श्लोकः)

ख) तदन्तरं हनुमतः वाक्यालापैः वर्णनीयवचनकौशलैश्च मुग्ध्वा रामचन्द्रोऽपि लक्ष्मणमनेन वाक्यजेन अमात्येन सह स्नेहपूर्णवाक्यालापयितुं निर्देशं प्रदत्तः इत्येवम् –

‘अभिभाषस्व सौमित्रे सुग्रीवसचिवं कपिम्।
वाक्यज्ञं मधुरैर्वाक्यैः स्नेहयुक्तमरिन्दमम्॥’ (किष्किन्ध्याकाण्डम् -२य सर्गः -

२७)

ग) पुनः तत्काले रामचन्द्रः लक्ष्मणमुवाच –

‘नानृग्वेद विनितस्य ना जयुर्वेदधारिणः।
ना सामवेद विदुषः सक्थमेवं प्रभाषितुम्।
नूनं व्याकरणं कृत्स्नमनेन बहुधा श्रुतम्।
बहु वायहरतानेन न किञ्चिदपशब्दितम्॥’ (किष्किन्ध्याकाण्डम् -२य सर्गः -२८, २९

)

वचनमिदं हनुमतः नररूपत्वस्य सर्वशास्त्रज्ञतायाः च प्रामाण्यस्वरूपम्, नास्त्यत्र सन्देहावसरः।

घ) सुग्रीवः सीतान्वेषणार्थं सैन्यप्रेषणकाले हनुमन्तं यत् यत् गुणान्वितं चकार, कोऽपि वन्यपशुः उक्तगुणान्वितः न भवेत् –

‘तेजसा वापि ते भुतं समं भुवि न विद्यते।
तद् यथा लभ्यते सीता तत्त्वमेवोपपादय॥
तय्येव हनुमन् अस्ति वलं बुद्धिः पराक्रमः।
देशकालानुवृत्तिश्च नयश्च नयपण्डितः॥’ (किष्किन्ध्याकाण्डम् -४४ सर्ग -६, ७)

ङ) वानराः रामचन्द्रस्य परिचयविषये पारस्परिकालापकाले रामचन्द्र ‘इक्ष्वाकुणां कुले जातः’ इति ऊचुः। लौकिकसमाजेऽपि दृश्यसादृश्यं दृश्यते यत्, कस्यापि परिचयप्रदानकाले एषः अमुकस्य कुले जातः इति वदति, न तु एषः मनुष्याणां कुले जातः इति। अतः यदि वानराः मनुष्यात् पृथक् भवेत् तर्हि ते अवश्यमेव रामचन्द्रः मनुष्याणां कुले जातः इति वदेयुः।

च) अशोककानने सीतां प्रति हनुमतः एका उक्तिः –



‘सुराणामसुराणाञ्च नागगन्धर्व राक्षसाम्।

यक्षाणां किन्नराणाञ्च का त्वं भवसि शोभने!’(सुन्दरकाण्डम् -३३अध्यायः -श्लोकः -६)

अत्र लक्ष्यणीयं यत्, यतः प्रश्नकर्ता स्वयं मनुष्यः, तदेतुः स मनुष्यरूपिणीं सीतां दृष्ट्वा भवती किं मानवी ? इति न पृष्ट्वा सुरासुर-नाग-गन्धर्व-रक्ष-यक्ष-किन्नर प्रभृतिषु मनुष्यकुलेषु कस्मिन् कुले जाता सीता, प्रश्नमिति जज्ञे। वयमपि कमपि मनुष्यं दृष्ट्वा कदापि न पृच्छामः, किं भवान् मनुष्यकुलजः? परन्तु पृच्छामः, किं भवान् ब्राह्मणः शूद्रो वा? यतः कस्मिन् मानवे दृष्टे सति सन्देहः जायते यत्, सम्मुखस्थः मानवः कस्मिन् कुलजः? न तु सन्देहः भवति, स मानवः न वा ? अतः सीतां प्रति हनुमतः प्रश्नेन बोध्यते यत्, वानरेऽपि मनुष्यत्वमस्ति ।

छ) किष्किन्ध्याकाण्डस्य युद्धप्रसङ्गे वाली-सुग्रीवयोः रणसज्जावर्णनया सुस्पष्टरूपेण प्रतिभातो भवति यत्, तौ न लाङ्गुलधारिणौ वन्यजीवौ। यतः कविना उक्तम् –

‘स ददर्श ततः श्रीमानसुग्रीवं हेमपिङ्गलम्।

सुसंवीतं अवष्टब्धं दप्यमानमिवालम्।।’ (किष्किन्ध्याकाण्डम् -१६ सर्ग -१४ श्लोकः)

अत्र पश्यन्तु , न केवलं सुग्रीवस्य हेमपिङ्गलेति रूपवर्णनं वाल्मीकिना कृतम्, परन्तु तेन हनुमत रूपप्रसङ्गेऽप्युक्तम् –

‘ततः काञ्चनशैलाभस्तरूपार्कनिभाननः’ इति। कस्यापि लाङ्गुलयुक्तस्य वन्यप्राणिनः गात्रवर्णः यथा सुवर्णपर्वतसदृशोज्ज्वलः आननञ्च प्रभातार्कसदृशं ज्योतिर्मयं न भवेत् तथैव युद्धकाले मानववत् रणसज्जायाः अपि न प्रयोजनं भवेत्।

ज) वाली-सुग्रीवयोः युद्धस्य उपमाप्रदानकाले वाल्मीकिना उक्तम् – तयोर्युद्धमभूद्धोरं वृत्रवासवरिव इति। अत्रैव पश्यन्तु , पशुद्वयस्य युद्धोपमा कदापि देवासुरयोः युद्धेन सह न तुलनीया अपि च व्याघ्र-सिंहरूपस्य पशुद्वयस्य युद्धेन सह तुलनीया । अतः वाली-सुग्रीवौ न वन्यपशवः।

झ) प्रश्नोत्थापितो भवेत्, किमर्थं वाल्मीकि मनुष्यरूपानां वानराणां लाङ्गुलसंयुक्तः कृतः? कथं वा ते मानवाः समुद्रलङ्घनं कृताः?

एतदुतरे वक्तव्यं यत्, वाल्मीकिः केवलं वारद्वयं लाङ्गुलप्रसङ्गमुवाच। समुद्रलङ्घनात् पूर्वं लङ्कादहनकाले च। परन्तु, कवेः लाङ्गुलसंयोगस्य उद्देश्यः कः? समुद्रलङ्घनात् पूर्वं कविना उक्तम् – समाविध्य च लाङ्गुलं हर्षात् वलमुपयिवान् इति। अत्र समह-आ-विध्+यत् इति व्युत्पत्त्याः समाविध्यः इति शब्दः निष्पन्नः, यत्र विध् इत्यस्य धातोरर्थः वन्धनम्। अतः समाविध्य इति पदस्यार्थः सम्यग्रूपेण वन्धनं कृत्वा। अत्र लक्षणीयम्, यदि लाङ्गुलः वानरस्य देहसंयुक्तः अङ्गविशेषः भवति तर्हि किमर्थं तस्य पुनः वन्धनप्रयोजनम्? अतः अवश्यमेव स्वीकरणीयम्, लाङ्गुलः वानरस्य देहावयवः न, परन्तु तत्कालीनः लाङ्गुलाकारः वायुचालिताकाशयानविशेषः। वानरस्य वायुचालिताकाशयानविषये कवेः उक्तन्तरमपि दृश्यते –

‘तस्य वानर सिंहस्य प्लवमानस्य सागरम्।

पक्षान्तरगतो वायु जीमुत इव गर्जति।।’(सुन्दरकाण्डम् -प्रथमसर्गः -६४ श्लोकः

)

अत्र पश्यन्तु, वानरस्य पक्षान्तरगतवायुः जीमुतवत् गर्जति। लाङ्गुलधारिजीवस्य यथा पक्ष नास्ति, तथैव देहावयवविशेषात् लाङ्गुलात् कदापि गर्जनमपि न भवेत्। वर्तमानेऽपि दृश्यते, पक्षयुक्ताकाशयानस्य गमनकाले गर्जनं श्रुते। अनेन प्रमाणितं यत्, तत्काले वानरः वर्तमानस्य पक्षयुक्ताकाशयानसदृशेन केनापि यानेन जगाम, यत् लाङ्गुलवत् दर्शनीयमासीत्। पुनः लङ्कादहनकालेऽपि दृश्यते, लाङ्गुले देहावयवे सति लङ्कादहनान्ते लाङ्गुलस्य कोऽपि अंशः दग्धीभूतो भवेत्। परन्तु तन्न वभूव। लाङ्गुलस्य पूर्णदग्धीभूतात् प्रागेव सागरसलिलैः तन्निर्वापितो वभूव।



अ) सुग्रीवाद्यस्य ऐश्वर्यं विलासव्यसनमभिजातरुचेश्च प्रमाणं प्राप्यते लक्ष्मणस्य किष्किन्ध्याराजभवनदर्शनेन। तत्र लक्ष्मणः इन्द्रभवनसदृशं यानासनमावृतं सप्तकक्षविशिष्टं सुग्रीवस्य मनोहरं राजभवनं सुरक्षितान्तःपुरञ्च ददर्श, यत्र ताललयसमन्वितं सुमधुरसंगीतपरिवेशनं वभूव –

‘पाण्डुरेण तु सालेन परिक्षितं दुरासदम्।

वाणरेन्द्रग्रहं रम्यं महेन्द्रसदनोपमम्॥ (किष्किन्ध्याकाण्ड – 33सर्ग, 14 श्लो.)

स सप्तकक्ष्या धर्मात्मा यानासनसमावृताः।

प्रविश्य सुमहद्भुस दद्रशान्तःपुरं महत्॥ (किष्किन्ध्याकाण्ड – 33सर्ग, 19 श्लो.)

तन्त्रगीतसमाकीर्णं समतालपदाक्षरम्॥ (किष्किन्ध्याकाण्ड – 33सर्ग, 21 श्लो.)

पुनरन्तःपुरं प्रविश्य लक्षणः स्वर्णसिंहासनोपविष्टं सुदृश्यास्तरणोपरि समासीनं सुग्रीवं ददर्श, यत् सुग्रीवस्य नराकृतेः प्रमाणम् –

‘ततः सुग्रीवमासीनं काञ्चने परमासने।

महार्हास्तरणोपेते ददर्शादीप्तसंनिभम्॥ (किष्किन्ध्याकाण्ड – 33सर्ग, 63 श्लो.)

ट) न केवलमेतत्, अस्य वानरसमाजस्य शवदाहनादि पारलौकिकानुष्ठानस्य यद्विवरणं दृश्यते, तेन सुचारुरूपेणानुमीयते, वानरप्रजातीनां मनुष्यानां जीवनशैलीऽपि वर्तमानकालस्य मनुष्यानां जीवनशैलीसदृशाऽसीत्। यथा, वालिनः मृतदेसत्कारस्य वर्णनायां कविना उक्तम्—

‘वानरैरुज्जमानां तां शूरैरिदहनचितैः।

दिव्यां भद्रासनयुक्तं शिविकां स्यन्दनोपमाम्॥

पक्षिकर्मभिराचित्रां द्रुम कर्म विभुषिताम्।

आचितां चित्रपतिभिः सुनिविष्टां समन्ततः॥

विमनानिवसिद्धानां जाल वातायनयुताम्।

इदृशीं शिविकां दृष्ट्वा रामलक्ष्मणं ब्रवीत्॥’

(किष्किन्ध्याकाण्ड – 25सर्ग, 22, 23, 24 श्लो.)

पश्यन्तु, अत्र शवदाहशिविका काष्ठनिर्मिता, विचित्रकारुकार्यसमन्विता, गवाक्षयुता, रक्तचन्दनचर्चिता, ध्वजशोभिता च, या सुवृहद्रथरूपा। वाहकाः दक्षवानराः प्रथमैव दृश्यते, काष्ठनिर्मितशिविकया सह मृतवानरस्य वाहकाः कदापि क्षुद्राकाराः वन्यपशवः न भवेयुः।

अस्य श्मशानयात्रायामपि दृश्यते मानविकलोकाचारदृश्यम्, यत्र शबबाहिकायाः शिविकायाः अग्रे रत्नविकीर्णकारकाः वानराः नदीतीरस्थश्मशाने उपस्थिताः बभूवुः –

‘विश्रानयन्तो रत्नानि विविधानि बहूनि च।

अग्रतः प्लवगा यान्तु शिविका तदन्तरम्॥’ (किष्किन्ध्याकाण्ड – 25सर्ग, 31

श्लो.)

अपि च नदातीरे चित्ताविरचनं कृत्वा शवदाहान्ते सामाजिकनियमानुसारेण सुग्रीवाङ्गदौ स्नात्वा नद्यां प्रेततर्पणं चक्रतुः –

‘पुलिने गिरि नद्यास्तु विविके जलसंवृते।

चितां चक्रुः सुवहवो वानराः वनरारिणः॥

अवरोप्य ततः स्कन्धाच्छिविकां वानरोत्तमाः।

तस्थुरेकान्तमाश्रित्य सर्वे शोकपरायणाः॥

ततोऽग्निं विविधं दत्त्वा सोपसव्यं चकार ह।

पितरं दीर्घमध्यानं प्रस्थितं व्याकुलेन्द्रियः॥

संस्कृत्य वालिनं तं तु विधिवत् प्लवगर्षभाः।

आजगमरुदकं कतडं नदीं शुभजलां शिवाम्॥'

(किष्किन्ध्याकाण्ड – 25 सर्ग,37,38,50,51

श्लोकः)

प्रसङ्गोऽस्मिन् लक्ष्यणीयं यत्, तत्र श्मशाने विलापकारिणी तारा उवाच – वालिनः एकान्तानुगताः चन्द्राननाः
प्लुतगमनविषये अज्ञाताः वानराः श्मशानं पादचारैः समागताः –

‘इमास्तास्तव राजेन्द्र वानयोड वल्ललभास्तवः।

पादैर्विकृष्टमद्वानागता कं न बुद्ध्यसे॥’ (किष्किन्ध्याकाण्ड – 25 सर्ग,43 श्लोकः)

अत्र लक्षणीयं , यस्य वल्लभाः पदव्रजैः श्मशानमुपस्थिताः, तासां प्रभुः कदापि जन्तुः न भवेत्।

ठ) वालिवधान्ते निपतितवालिनं वधकारणज्ञापणकाले रामः अव्रवीत् – अस्य शैलकाननपूर्णस्थानस्य मृग-विहग-
मनुष्यानां दण्डपुरस्कारे इक्ष्वाकुवंशीयाः ईशाञ्चक्रिरे –

‘इक्षाकूणामियं भूमिः सशैलवनकाननाः।

मृगपक्षिमनुष्याणां निग्रहानुग्रहेषपि॥’ (किष्किन्ध्याकाण्ड – 18 सर्ग, ६ श्लोकः)

पश्यन्त्वत्र रामेन वानरेति नोल्लेखं कृतम्, यतः वानराः मनुष्याः एव बभूवुः। विपरीते तु रामेन कथितव्यं यत्,
यथा इक्ष्वाकुवंशीयाः अपराधकाले वानररूपजन्तून् दण्डदानं चक्रुः, तथा सोऽपि वानरस्वरूपं वालीनं
दण्डदानञ्चकार। पुनः रामेन उवाच , सः मनुस्मृतिमवलम्ब्य पारलौकिकविमोचनार्थं वालीनं जघान। अस्मिन्
प्रसङ्गे रामः मनुवचनमब्रवीत् –

‘राजभिर्धृतदण्डाश्च कृत्वा पापानि मानवाः।

निर्मलाः स्वर्गमायान्ति सन्तः सुकृतिनः॥’ (किष्किन्ध्याकाण्ड – 18 सर्ग, 33 श्लोकः)

अत्र लक्ष्यणीयं यत् , पापिमनुष्याणां ऐहिकं पारलौकिकञ्च पुण्यार्थं यथा राजदण्डः प्रदत्तो भवति, तथैव
मनुष्याकारः वालीऽपि भ्रातृजायाग्रहणरूपपापाचरणार्थं रामेन शिष्यते।

ड) महाभारतेऽपि दृश्यते – रक्षः, वानरः, किन्नरः, यक्षश्च महातपस्विनः ऋषेः पुलस्तस्य पुत्राः आसन् -

‘राक्षसाश्च पुलस्तस्य वानराः किन्नरास्तथा।

यक्षाश्च मनुज व्याघ्रा पुत्रास्तस्य च धीमताः॥’

(महाभारत – आदिपर्वः 7 म

अध्यायः 66 श्लोकः)

अतः ऋषेः पुलस्तस्य पुत्राः कदापि न वन्यजन्तवः भवेयुः , ते अवश्यमेव मानवाः ।

ढ) पुनः यक्ष्यते पूज्यते इति यक्षः। हिमालयस्योत्तरस्थाः किम्पुरुषवर्षवासिनः महर्षेः पुलस्तस्य पुत्राः एव यक्षाः
किन्नरश्च, येषां यक्षाणां नृपतिः कुवेरासीत्।

ण) रक्षत्यस्मां रक्ष एव राक्षसः। निकषा- विश्वश्रवयोः पुत्रः एव राक्षसः। ऋषिपुत्रैकः अधुना राक्षसाकारस्य
धारनायाः विपरीताः। ते न तु विकटाकाराः, दीर्घनखयुक्ताः आसन्। केवलं गुणधर्माभ्यां एतद्रूपं प्रजातिविभाजनं ।
राक्षसानां धर्मविषये अस्त्युक्तिः –

‘परदारामिर्षित्वं परार्थेऽपि च लोभुषाः।

स्वाध्याय ब्रम्हके भक्ति धर्माऽयं राक्षसाः स्मृताः॥’

राक्षसन्पतिः रावणः एतद्विषये प्रमाणम्, यः राक्षसे सत्यपि महाप्राज्ञः आसीत् ।

त) महाभारतस्य अनुक्रमणिकाध्यायामपि दृश्यते, सुरासुराणां सृष्टिवर्णनप्रसङ्गेन वैशम्पायनेन उक्तम्- महर्षिकश्यपात् देव-दानव-मानव-वानर-सुपर्ण-नागाश्च ससृजुः। शतपथब्राह्मणेऽपि अस्ति – तस्मात् कश्यपात् इमाः प्रजाः (शतपथ – 7-5-1-5)। अर्थात् कश्यपादेव विश्वस्यास्य सर्वं सृष्टम्। महाभारतस्य आदिपर्वे दृश्यते – “मरीचैः कश्यपोः जातः, कश्यपात् तु इमा प्रजाः” इति। अनेनापि प्रामाणितं भवति, न केवलं वानरः, दानव-यक्ष-रक्ष-किन्नर-गन्धर्व-गरुडादिकक्षी प्रभृतयः सर्वे मनुष्याः। प्रसङ्गेऽस्मिन् वक्तव्यं यत्, शतपथब्राह्मणस्य कश्यपेति शब्दस्यार्थं महाभारतस्य च कश्यपेति शब्दस्यार्थः न एकरूपः। परन्तु महाभारतस्य टीकाकाराः शतपथब्राह्मणस्य कश्यपात् सृष्टीवानामर्थं महाभारतस्य कश्यपात् सृष्टिजीवे आरोपत्वात् भ्रान्तिसर्जनं भवति। शतपथब्राह्मणस्य कश्यपेति शब्दस्यार्थः परमात्मा, कश्यपः कस्मात् कस्यपो भवतीति (निरुक्तम्)। पश्यतीति पश्यः पश्य एव कश्यपः। अर्थात् यः चराचरस्य सर्वमेव यथार्थरूपेण पश्यति, स एव कश्यपः। ततः आद्यन्त विपर्यायाश्च – महाभाष्यकारस्य सूत्रेनानेन आद्यन्तवर्णयोः स्थानपरिवर्तनात् कश्यपेति शब्दः निष्पन्नः। अर्थात् कश्यपोऽपि परमात्मावाचकः, न तु ऋषिमात्रः। अयं कश्यपसदृशः न महाभारतीयकश्यपः, तस्य पुत्राः अपि मनुष्येतराः।

थ) गरुड-जटायु-सम्पातीना पराक्रमं पाण्डित्यञ्च दृष्ट्वा तेषां विहगस्वरूपकल्पनमपि अचिन्तनीयम्। सुपर्णशब्दः विहगवोधकः। महर्षिकश्यपविनतयोः पुत्राः दाक्ष्यः, अरिष्टनेमि, गरुड, अरुणः प्रभृतयः सम्पुर्णाः। गरुडेन सह कद्रुनन्दननागजातीयानां महारणेन नागाः विध्वंसाः वभ्रुवुः, पृथिव्यामपि तत्काले गरुडनामकपक्षिविशेषः सर्पभक्षणञ्चकारः। एतदृष्ट्वा वैनतेयगरुडं सर्पखादकपक्षिकल्पनं सर्वाज्ञतामात्रम्। वैनतेयगरुडः यथा मातृभक्तः महातपस्वी, विश्वजयीक्षमताधिकारी च आसीत्, तथैव जटायुरपि दशरथस्य परममित्रः शास्त्राभिज्ञः चासीत्। विशेषतः ज्योतिषशास्त्रे जटायुः इत्यस्य परिचयः प्रशंसनीयः। पश्यन्तु, जटायुः रामलक्ष्मणौ सीतायाः पुनःप्राप्तिर्विषये उवाच -

येन याति मुहुर्तेन सीतामादाय रावणः।

विप्रनष्टं दनं क्षिप्तं तत् स्वामी प्रतिपाद्यते॥ (अरण्यकाण्डम् – 68 सर्ग 12 श्लोकः)

विन्दो नाम मुहूर्तोऽसौ न च काकुत्स्थ सोऽबुधत्॥

(अरण्यकाण्डम् – 68 सर्ग 13 श्लोकः)

अर्थात् मा कुरु दुःखम्। सीतापरहरनस्य मुहूर्तं विन्दो इति कथ्यते। ज्योतिषशास्त्रानुसारेण अस्मिन् क्षणे अपहृतद्रव्यस्य अवश्यमेव पुनर्प्राप्तिर्भविष्यति। इदं ज्योतिषवैज्ञानिकतथ्यप्रदानं केनापि विहगेन सम्भवम्। अन्यत्रापि पश्यन्तु, वेदमन्त्रस्य स्वस्तिवचने इन्द्रादिदेवैः सह वैनतेयानां स्तुतिं दृष्ट्वा अनुमेयं भवेत् , सुपर्णप्रजातयः नासन् मनुष्यातिरिक्तजीवाः -

‘स्वस्ति न इन्द्रो वृद्धश्रवाः स्वस्ति नः पूषा विश्ववेदाः।

स्वस्ति न स्तार्क्ष्यो अरिष्टनेमिः स्वस्ति नो बृहस्पतिर्दधातु॥’ (ऋग्वेदः -

1,8,9,6)

द) कद्रुनन्दनाः अपि नासन् सरीसृपाः, यद्यपि तत्र सर्प इति शब्दः उल्लिखितः, तथापि सर्पशब्देन तत्र सर्पपदवियुक्तमानवाः बोध्याः। महाभारतम् , मार्कण्डेयपुराणञ्च एतस्य सर्पस्य मनुष्यत्वस्य प्रामाण्यम्। मार्कण्डेयपुराणे दृश्यते - -

‘शका यवन कम्बोजाः पारदा पङ्कवास्तथा।

कोलि सर्पा महिषका दारवाश्चलाः स केरला॥’



अत्र लक्ष्यणीयं, महाराजसगरेण धर्मच्युतप्रजातिषु सर्प इत्यपि अस्ति, यः मनुष्याकारप्रजातिविशेषः, न तु सरीसृपजातीयः।

पुनः तक्षक-ककोट-प्रभृतिर्देवयोनिर्मनुष्यकारः भरतस्य अनया उक्त्या स्पष्टतः एव बोधगम्य भवेत्, देवयोनिजाताः तक्षकादयः मनुष्यकाराः।

महाभारतस्यादिपर्वाणुसारतः शेषनागेन तपस्तुष्टः ब्रह्मा तं वरं प्रदत्तम्, येन प्रमाणीयते शेषनागः न सरीसृपः, महातपस्वी मानवैकः।

अपि च महाभारतस्य एका काहिनी विषयस्यापि दृढतमप्रामाण्यस्वरूपा यत्र दृश्यते, दुर्योधनादयेन विषप्रयोगात् जले भासमानाचैतन्यं भीमसेनं दृष्ट्वा नागदेशीयाधीपतिः वासुकी उवाच- भीमः स्वदौहित्रस्य कुन्तीभोजस्य दौहित्रः -

तदा दौहित्र-दौहित्रः परिषक्तः सुपीडितम्।

सुप्रीतिश्चाभवत् तस्य वासुकीः स महायशः॥ (आदिपर्व - श्लोकः -

128,65)

पश्यन्तु, भीमैकः मानवः, यः नागराजस्य दौहित्रस्य दौहित्रः। अथ कथं नागराजः सरीसृपविशेषः? नागे सर्पत्वारोपः रज्जौसर्पत्वारोपवत् अयथार्थज्ञानम्। स्मर्तव्यं यत्, कालीयनागोऽपि न सरीसृपः आसीत्, यतः हरिवंशस्य वर्णनानुसारेण श्रीकृष्णः कालीयनागं बाहुयुद्धेन पराजितं चकार। मानवकृष्णेन सह सरीसृपस्य बाहुयुद्धं कथं सम्भवम्? पुनः नागस्यास्य भार्याः कर्णालंकारैः वेणीविभङ्गैश्च विभूषिताः वभूवुः। इदमपि कालीयनागस्य मानवरूपत्वे प्रामाण्यम्।

उपसंहारः

अतः सर्वप्रमाणं निरीक्ष्य वक्तुं समर्थः यत्, समालोचिताः संस्कृतमहाकाव्यान्तर्गताः मनुष्येतरप्राणिणः न केवलं मनुष्याः, ते शिक्षा-संस्कृति-स्थापत्य-भास्कर्य-संगीत-शिल्पकला-ऐश्वर्य-आभिजात्य-पराक्रम-धर्मसंस्कार-वेशपारिपाट्य-अलंकारप्रसाधन-शास्त्राचार-प्रभृतिषु अतीव पारङ्गमाः आसन् । तेषु पशुत्वम्, खेचरत्वम्, सरीसृपत्वञ्चारोपम् अज्ञातायाः परिचायकमात्रम् भ्रान्तज्ञानञ्च । एतस्मिन्विषये गवेषणायाः प्रयोजनमप्यस्ति ।

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ACHIEVEMENT OF SENIOR SECONDARY SCIENCE STUDENTS WITH REFERENCE TO GENDER AND LOCALE

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ABSTRACT

The present investigation aimed to know the effect of Gender and Locale on Achievement of senior secondary science students. For the purpose a sample of 200 male and 200 students of science group was selected from various senior secondary schools of Jhansi district, by using accidental technique of sample selection. In the present study the Descriptive survey method of research was used. For measuring achievement of senior secondary students, percentage achieved by the students in the High School public examination is considered as achievement score. Results revealed that the female and urban students showed higher achievement as compared to male and rural students.

Key Words – Achievement, Gender, Locale, Senior Secondary and Science Students

INTRODUCTION

The concept of achievement understood in social and educational context centers around the success of students in terms of scoring higher marks in examination, in securing jobs at the higher level of employment or achieving reputed positions in the society. Otis Dudley Duncan and others (1972) argue that occupation is an important parameter of achievement. On the other hand, J.W.B Douglas (1968) and his associates define achievement in terms of high performance of children in school tests. It is true that they have not specified and explicit model for educational achievement but their data do address the relationship between the socio-economic status and other characteristics of the family on one hand the performance of children in both primary and secondary schools on the other hand. Higher performance in terms of scoring more than the mean in school tests has been regarded as the basis of comparing achievement. There may be controversy regarding the type of examination intended to test the intelligence of the students but there is no controversy regarding as to the scoring of higher marks or grades as the basis of achievement for scoring of higher marks or grades is the only valid yard stick of testing intelligence or merit.

Many previous studies have only given importance to intellectual factor in predicting academic achievement. Earlier studies have indicated that intelligence influencing the academic achievement (Douglas, 2006). It was believed that high IQ or strong scientific mind is the main measurement of academic success (Abi-Samra, 2000). Literature shows that for many years the study of intelligence as a predictor of success focused mainly on the adaptive use of cognition (Piaget, 1972). In the present scenario, our classrooms tend to be dominated by approaches that emphasize principles, facts, theories, generalization and memorization associated with specialization at the expense



of generic skills which promote originality and social skills such as creativity, self-concept and motivation. Thus, intelligence is not the sole factor in determining academic achievement. Individual differences in intelligence cannot be accounted for all the major differences in achievement. The present study attempts to suggest that there are certain other biographical variables which may also play a significant role in determining student's academic achievement.

On the basis of above discussion, it may be inferred that achievement, might hold the key in examination system and success. Keeping these variables in view, the present study aims at investigating the relationship between academic achievement at school level with gender and locale.

OBJECTIVES OF THE STUDY

1. To study the Achievement of senior secondary science students with reference to Gender.
2. To study the Achievement of senior secondary science students with reference to Locale.

HYPOTHESES OF THE STUDY

1. There exists no significant difference in achievement of male and female senior secondary science students.
2. There exists no significant difference in achievement of urban and rural senior secondary science students.

METHODOLOGY

SAMPLE

A sample of 200 male and 200 female students of science group was selected from various senior secondary schools of Jhansi district, by using accidental technique of sample selection.

METHOD

In the present study the *Descriptive Survey method* of research was used.

TOOLS

For measuring achievement of senior secondary students, percentage achieved by the students in the High School public examination conducted by Uttar Pradesh Board of Secondary Education, Allahabad is considered as achievement score.

STATISTICAL TECHNIQUES

The data were analyzed by the use of various statistical techniques viz; Mean, Standard Deviation and Critical Ratio.

RESULT AND DISCUSSION

The purpose of the present study is also find out the differences between Achievement of male and female senior secondary science students. Differential for these groups are discuss under following heads.

1. COMPARISON OF ACHIEVEMENT ON THE BASIS OF GENDER

To test the hypothesis that '*there exists no significant difference in achievement of male and female senior secondary science students*', the researcher has applied t-test. The summary of t-test is presented in the table-1 given below.

Table-1
Mean, SD and CR Values of Achievement scores of male and female senior secondary science students

Gender	N	Mean	S.D.	t-value	Degree of Freedom	Significance Level
Male	200	55.45	9.76	2.53	398	Significant at .05 level
Female	200	58.20	11.90			

It is revealed from the Table-1 and Figure-1 that for achievement scores, the female senior secondary science students have higher mean scores ($M=58.20$) in comparison to male senior secondary science students ($M=55.45$). The computed 't' value for Achievement of male and female students is 2.53, which is greater than the table value at 0.05 level of significance. By inspecting the means of this group it is found that female group is higher than male group. Therefore, the hypothesis that '*there exist no significant difference between achievement of male and female senior secondary science students*' was rejected. It shows that Achievement of male and female students differ significantly. In other words, gender does affect the achievement of senior secondary science students. Above findings may be supported with that of Dev, Meenu (2016) who came out with the conclusion that achievement of male and female students differ significantly. Female students showed higher achievement as compared to male students.

2. COMPARISON OF ACHIEVEMENT ON THE BASIS OF LOCALE

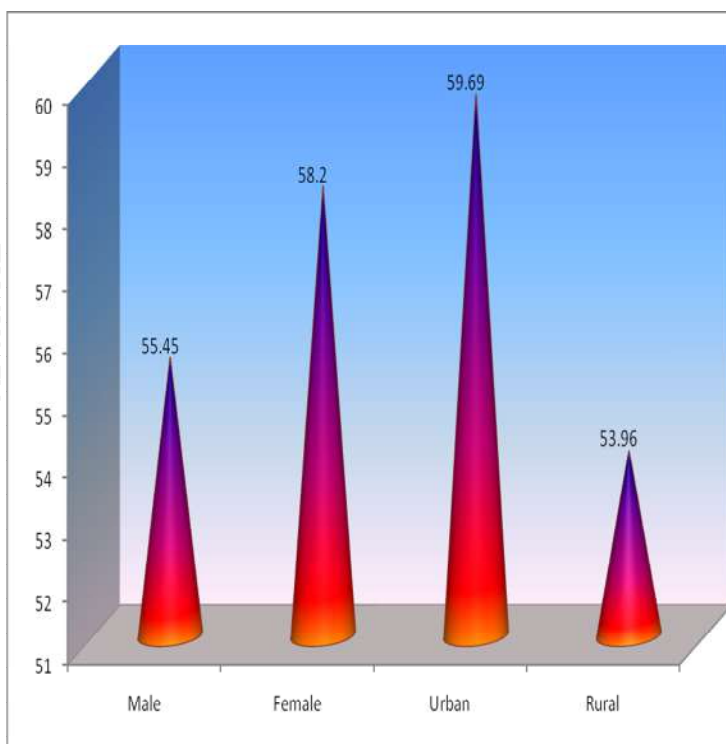
How far the locale of students is influencing the achievement is one of the objective of the study. The hypothesis which was tested to achieve this objective was that '*There is no significant difference in achievement of urban and rural senior secondary science students.*' To test this hypothesis CR-test was applied. Results obtained are presented in the table-2.

Table-2
Mean, SD and CR Values of Achievement scores of urban and rural senior secondary science students

Locale	N	Mean	S.D.	t-value	Degree of Freedom	Significance Level
Urban	200	59.69	10.59	5.42	398	Significant at .01 level
Rural	200	53.96	10.58			

The obtained results shown in the above table clearly depicts that the urban senior secondary science students have higher mean scores of achievement ($M=59.69$) in comparison to rural senior secondary science students ($M=53.96$). The computed 't' value for achievement of urban and rural students is 5.42, which is significant at 0.01 level of confidence. By inspecting the means of this group it is found that urban group is higher than rural group. Therefore, the hypothesis that '*there exist no significant difference between achievement of urban and rural senior secondary science students*' was rejected. It shows that Achievement of urban and rural students differ significantly. In other words, locale does affect the achievement of senior secondary science students. Above findings may be supported with that of Dev, Meenu (2016) and Singh (2007) who came out with the conclusion that academic achievement of urban and rural students differ significantly. Urban students showed higher achievement as compared to rural students. Figure-1 also support this fact and shows the comparison between achievement in relation to gender and locale of the students.

Fig. 1 Diagram showing comparison between





EDUCATIONAL IMPLICATIONS OF THE STUDY

The present investigation has revealed that higher the achievement higher is the creative ability and higher the creative ability higher is the achievement. This is found true for all the adolescents irrespective of gender and locality. As such, the schools should take special programmes to help the children belonging to high or average achievers strata to improve their creative ability. Parents should also provide them better facilities within their means. Every parents should be alert to notice the creative work of their children and give them proper encouragement, guidance and assistance, they should instill confidence in their children regarding their own original ideas. Since the child spends more time at home, parents have many opportunities for encouraging creative ability by carefully looking after their interests and accepting their ideas. The following some recommendations are suggested :-

1. The overall achievement level of students was found to be average. It points out that schools may concentrate on appropriate way of teaching different subjects, the remedial teaching for weaker students, homework and enrichment exercises may be provided for the students which may increase their performance level.
2. Teachers are under pressure to assist in the effort to increase students' achievement. They can respond to his challenge by taking more initiatives to improve the school climate, using direct interventions such as teaching study skills and involving students in achievement motivation groups, and by increasing the involvement of parents in the educational process.
3. There is a great role of home in improving the various faculties of the child such as academic, mental, creative, social and aesthetic etc. the Parent Teacher Association (PTA) may contribute to a great extent in bring coordination between teacher and parents. The frequent meeting will help in developing proper study habits and parents awareness about taking interest in the education of their children. The parents' attention may be attracted towards the child's behavior and attainment for all round development of the students.
4. It is said that a sound mind in a sound body. The yoga and value education may be introduced in all schools at all levels to inculcate healthy practices among the students.
5. The well qualified teachers are to be appointed. There is enrichment of content in every subject. The teachers have great role in improving the standard and quality of education. Every care should be taken to appoint teachers who suits to the system and society in this scientific era. The school libraries be enriched and used by the students. The facilities in ICT be provided in schools for equipping students and teachers with the latest technology. The teacher orientation camps should be conducted regularly in skills handling the youths appropriately.

From the above recommendations it can be concluded that the school administrators, teachers, parents and government may be able to perform well their roles or duties to the fullest of their potentialities, it will inspire the students to develop mentally, innovatively and academically.



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PRICE SPREAD IN HORTICULTURAL MARKETS OF ASSAM

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1. INTRODUCTION

In developing countries, due to high transport costs, the lack of reliable price information, and the inability to verify the quality of produce, farmers who produce cash crops are often exploited by intermediaries. There is growing recognition among economists and policymakers that this lowers farmer's profitability and reduces incentives to produce and control quality thereby leading to an adverse effect on both equity and efficiency (Pranab Bardhan 1989; Jason Clay 2004).

Marketing is a vital tool for developing agriculture sector of Assam. Agriculture marketing can be defined as physical and institutional set up to perform all activities involved inflow of goods and services from point of initial producer to ultimate consumer (Acharya's book 2011). Though agricultural marketing is an important link in the chain of production activities of agriculture sector, it is largely unorganized and is in the hands of intermediaries such as retail traders, wholesalers, pre harvest contractors and others. This type of marketing is called traditional marketing channels. The traditional rural marketing channels mainly functions as a primary market which serves small areas of 1.5 km to 5 km radius and operates once or twice a week. There are 1150 markets in Assam which are known as haat where the farmers sell their produce through an open outcry ascending bid auction.

The agricultural marketing especially the horticultural marketing in India is highly decentralized having wide capacities. There is no direct connection between farmers and consumers which implies that traditional marketing channels prevail in the rural horticultural markets of India. The traditional marketing can be defined as that type where large number of middlemen are involved, marketing conditions are poor and where marketing efficiency is less. The high and fluctuating consumer prices exist in horticultural markets and due to this fact only a small share of the consumer rupee reaching the farmers. Many committees reviewed it and the reports stated that Indian farmers are good producers but not good marketer. As early as 1976, National Commission on Agriculture pointed out the inefficiency in agricultural marketing with particular reference to fresh perishables and strongly recommended that, "It is not enough to produce a crop; it must be satisfactorily marketed." The marketing of horticultural crops is complex especially because of perishability, seasonality and bulkiness. Fruits and vegetables are the items of daily consumption, and though perishable in nature, they constitute essential component of human diet. Many a time, fruits & vegetables are marketed mostly either through regulated APMC markets or totally unregulated local fruit and vegetable markets. Marketing through these traditional channels is characterized by very little attention to grading, sorting and storage with weak regulation, poor handling during loading, unloading and transport resulting in loss of 30-40 per cent of the total production. This involves long distance transport. For these purposes good roads in the interior villages is necessary but there are no good roads in the interior areas. Vegetables are usually sold through commission agents and very little of pre-harvest contacting is done. Due to this, the net returns are generally low. In case of marketing of fruits and vegetables, producer cannot go to wholesale market or long distant market and he has to depend on some intermediaries to sell his produce. Therefore, in the marketing of fruits and vegetables costs are to be incurred for grading, packing, transport, loading/unloading, fees, etc. In addition, the intermediaries also charge some margins for them. These costs and margins determine the final price to be paid by the consumer. Hence retail price becomes very high.

Due to variation of price across the rural market the farmers get only 1/3 of retail or consumer price. Rest is absorbed by intermediaries which is loss to actual producers. So spatial price



dispersion of agro crops specially vegetables crops are observed in markets. Farmers often do not have any information about market conditions prior to the sale. Moreover, processors are unable to perfectly monitor the traders. So Organized marketing is a precondition to sustain production and marketing programme, more particularly, in respect of horticultural production.

Efficient marketing mechanism ensures better price of farm product and helps in getting profit to actual farmers. With the implementation of APMC Act 1972, Direct marketing is an innovative concept of emerging marketing system, which involves marketing of produce by the farmer directly to the consumers/millers without any intermediaries. Direct marketing enables producers and other bulk buyers to economize on transportation cost and improve price realization. It also provides incentive to large-scale marketing companies and exporters to purchase directly from producing areas. Direct marketing helps to generate the idea of market oriented production and increases profit of the producer. It helps in better marketing, minimizes marketing cost and encourages distribution efficiency. It promotes employment to the rural sectors.

This paper examines the impact of traditional and direct marketing on the share of producers in horticultural markets of Assam. The study area is Assam with special reference to Darrang District. And since there is large amount of price spread in case of vegetables, so for sampling I take into account the impact of marketing channels on producers in case of two vegetables- ridge gourd and cucumber and price dispersion of tomato between wholesale and retail market.

Though various studies are done regarding agricultural marketing, there is need for addressing the impact of traditional marketing channels of horticultural marketing in rural areas of Assam. It is also important to know how the emerging marketing channels reduce the share of intermediaries and increase the share of farmers in retail price. To study these aspects, Darrang district is chosen for taking sample survey. In Assam, Darrang district is a large supplier of agriculture specially horticulture crops. Large amount of vegetables are supplied from Darrang district to different corners of Assam. But the most of farmers of Darrang district are small and marginal farmers whose are very poor. Since most of them are illiterate they do not get proper marketing information, even they don't know the retail price of selling products. The trader, commission agent, wholesaler takes their crops at a very low price and sell them in retail market at a very high price. The supply chain is multilayered and farmers are exploited. For studying their problems, supply chain and price spread of vegetables crops, Darrang district is taken into account.

Review of literature

The review of literature is related to the problems related to agricultural marketing, imperfection of market, imperfection of information about price between producers and buyers, and importance of ICT on improving the marketing infrastructure.

Gopalan and Gopalan(1991), BC Mathur(2000), Elamathi C(2013), Sanjay Kumar discussed various problems of marketing channels of agriculture specially infrastructural problems, organizational problems, price spread between producer's share and consumer rupee, lack of awareness, lack of proper price information, long marketing channels which include large no of intermediaries, illiteracy of farmers .

Saikia and Borah (1998), Pandey (2003), Kakaty (2009) discussed about price spread between producers and market intermediaries in the consumer price in the traditional marketing channels and showed that due to prevalence of intermediaries producers get lower share and suggested emerging marketing channel for improving marketing efficiency.

Shakeel, Selvaraj, Swenson and Yanagizana, Robert Jensen, Sandip Mitra stated that internet facilities ,mobile facilities drastically reduce the search cost and thereby reduce retail price which

enable the market to become more competitive. He showed that the internet market places an alternative or supplements to traditional retail market and make market more developed.

OBJECTIVES OF STUDY

The main objectives of this study are explained-

1. To study the rural marketing system of Assam.
2. To study the share of farmers in consumer price of horticultural crops.
3. To estimate the degree of marketing efficiency and price dispersion in rural agricultural market.
4. To study the constraints faced by the farmers in rural agricultural market.

RESEARCH QUESTIONS

- Are the farmers getting actual price of their product? If not why?
- What are the problems in agricultural marketing?

DATA SOURCE AND METHODOLOGY

The data is collected through primary and secondary sources. The research is analytical in nature.

DATA SOURCES

- i. The secondary data is collected through various reports published by agriculture department, economic surveys, statistical handbooks, journals, website such as department of agriculture, economics and statistical department of Assam.
- ii. The primary data is collected by conducting survey, with the help of multistage random sampling method. The survey is conducted by collecting data from farmers, retailers, traders, marketing committee and consumers. 10 farmers of each crop are taken into survey, two blocks and two villages of each block are taken into sample survey. For selection of buyer, contractor, commission agent, retailer, trader, faria, 5 buyers, 5 contractors, 5 commission agent, 5 traders and 5 farias for each vegetable crop are taken into primary survey.

Conceptual framework: The concepts which are used to study the impact of traditional and emerging marketing channels are marketing cost, marketing network, marketing efficiency, marketing channels, price spread. These concepts are explained as follows-

- a. **MARKETING CHANNELS**-Marketing channels are routes through which agricultural products move from producers to consumers. There are two main routes – a. Direct routes- in which agricultural commodities directly pass from producer to consumer. There is a complete absence of middlemen or intermediaries and in Indirect route agricultural commodities generally move from producer to consumers through intermediaries. The intermediaries are involved in indirect channels which is called traditional marketing channels.
- b. **MARKETING EFFICIENCY**- The term marketing efficiency may be defined as the effectiveness or competence with which a market structure performs its designated functions. Thus it implies the effectiveness with which a marketing service is performed. According to Acharya, an ideal measure of marketing efficiency, particularly for comparing the efficiency of alternate markets or channels should be such which takes into account all of these – $MC = \text{Total marketing cost}$, $MM = \text{Net marketing margins}$, $FP = \text{Price received by the farmers}$, $Pf = \text{Price paid by the consumers}$.

Thus the following modified measure is - $MME = FP / MC + MM$,

c. PRODUCER'S PRICE

This is the net price received by the farmer at the time of first sale. This is equal to the wholesale price at the primary assembling centre, minus the charges borne by the farmers in selling his produce. Thus

$$Pf = Pa - C_f$$

d. PRODUCER'S SHARE IN THE CONSUMER'S RUPEE



Producer's share is the price received by the farmers expressed as a percentage of the retail price. If Pr is the retail price, the producer's share in the consumer's price may be expressed as follows-
 $Ps = (Pf/Pr) \times 100$, where Pf is producer's price, Ps is the producer's share in consumer's rupee, Pr is retail price.

e.MARKETING MARGINS OF A MIDDLEMAN : This is the difference between the total payments and receipts of the middleman. These alternatives measures may be used to know the market margin which are expressed as follows-

- i. Absolute margin of ith the middleman $.A_{mi} = P_{ri} - (P_{pi} + C_{mi})$
- ii. Percentages margins of ith middleman
 $P_{mi} = P_{ri} - (P_{pi} + C_{mi}) / P_{ri} \times 100$

f.TOTAL COST OF MARKETING

The Total cost incurred on marketing by the either producer or by the various intermediaries involved in sale and purchase of the commodities till the commodities reaches the ultimate consumers may be computed as follows-

$$C = C_f + C_{m1} + C_{m2} + C_{m3} + \dots + C_{mn}$$

Where C= total cost of marketing of the commodity.

C_f = Cost paid by the producer from the time the produce leaves the farms till he sell it,

C_{mi} = Cost incurred by the ith middlemen in the process of buying and selling the product.

Some of the costs are linked with the quantity marketed and some are linked with the value to the commodity.

g. RELATIONSHIPS OF FARMER'S PRICE, MARKETING COST, CONSUMER'S PRICE

The farmer receives that portion what the consumer pays after deduction of various costs of marketing. This residual expressed as a percentage of the price paid by the consumer is the farmer's share. The farmer's share may be calculated as follows-

$$FS = (RP - MC) \times 100 / RP \quad FS = PF \times 100 / RP \quad \text{Where, } FS = \text{Farmer's share in consumer's rupee, } RP = \text{Retail price, } MC = \text{Marketing cost}$$

ANALYSIS AND DISCUSSION

The researcher wants to study rural marketing system of Assam, the share of producers, intermediaries in retail price of vegetable crops and price spread of these crops. This discussion is explained as follows-

1. RURAL MARKETING SYSTEM OF ASSAM

Rural agricultural marketing can be defined as a function which manages all these activities in assessing, stimulating and converting purchasing power into effective demand for specific production and moving them to people in rural areas to create satisfaction and improve the standard of living for them. Rural periodic markets are known as haats and they are oldest trading institutions.

Rural marketing In Assam generally perform three functions-

- i) Selling of local produce within the area,
- ii) Assembling of local produce for selling to others,
- iii) Retailing of wholesalers from producers to local areas.

The selling of local product is the predominant activity in these markets. There are 1273 markets in Assam comprising primary and secondary markets. In each market area, there is one market yard and more sub market yards.

The haats and regulated markets are two major channels existing in the state for marketing of agriculture product. The number of rural agricultural markets is highest in Barpeta district. The rural farmers sell their products to itinerant traders namely as faria and such sales constitutes about 60 % of their marketable surplus. The remaining percentages are sold to village merchants. The dadan system is still prevalent in rural areas under which village money lender advance loans to cultivators at the time of need. The cooperative network is very much weak and understates the

procurement of agriculture product. The farmers sell their product in small quantity through the network of regulated markets and large number of their product is sold in rural unorganized markets at regular intervals. The rural markets are of traditional in nature and many times the farmers are at a disadvantages at striking their bargains due to various economic reasons such as lack of adequate infrastructure, indebtedness etc.

The apex of cooperative body of the state cooperative markets is functionally weak to provide any support to primary rural markets. Processing activities are absent and the consumer has to pay nearly double. The regulated markets possess poor marketing infrastructure. There are 3 cold storage of 5000 MT capacity available in the state and regulated markets have no shops of agriculture inputs. In the absence of grading, the farmers often get a low price for their product. The regulated market committee charges 1 percent cess on the market transaction while panchayats managing the rural markets charge 10 percent from buyers of farm product. The large price variation due to lack of infrastructure force the farmers to sell at harvest times at a lower price and in retail market there is higher price. So the marketing system should be strengthened to become a stronger link of state agricultural economy.

MARKETING NETWORK AND AGRICULTURE MARKETING AND STORAGE FACILITY IN ASSAM

At present the marketing network and marketing infrastructure of Assam are explained below- Rural go down= 66, Rural seed storage go down- 13, cold storage- 25, Principal Marketing yard- 20, Sub Market – 206, regulated marketing committee- 24, Total Regulated Market- 224, wholesale market- 405no, rural primary markets- 806, drying platform- 42, Trader's shop- 143, packaging room-18, Auction platform- 532, Total markets- 1175, organized market-1, processing units- 15, cold storage- 26. The chief minister has proposed to set up 30 cold storage in Assam at an estimated cost Rs150 crore in 2013-14. (Collected from economic survey 2014-15)

To assist the farmers for carrying vegetables to distant market, The Assam State Marketing board provided transport subsidy to 980 farmers. The state Govt proposed to construct three storied market at Pamohi (Guwahati), Growers consumers market complex at Ulubari, and establish 11 numbers of sale counters for marketing of farm product. The rural connectivity scheme implemented under PMGSY is a major step towards benefit of farmers to take out their agricultural products to nearest urban markets.

2.Area, production and productivity of horticulture crops of Assam in 2014-15

year	Fruits			Spices			vegetables		
	Area(lakh hect)	Production (lakh MT)	Productivity MT/hect	Area(lakh hect)	Production (lakh MT)	Productivity	Area(lakh hect)	Production (lakh MT)	Productivity
2005-06	1.13	13.52	12005	0.86	2.12	2475	2.32	18.18	16485
2006-07	1.14	13.72	12139	0.86	2.12	2476	2.36	38.87	16469
2007-08	1.16	14.08	14142	0.88	2.18	2478	2.38	39.18	16462
2008-09	1.34	16.61	12425	0.93	2.80	3023	2.46	44.20	17923
2009-10	1.27	15.65	12370	0.94	2.35	2505	2.51	42.55	16952
2010-11	1.37	16.56	12485	1.01	2.30	2271	2.57	44.33	17231
2011-12	1.38	17.75	12885	1.04	2.56	2464	3.66	52.51	24325
2012-13	1.51	20.74	13760	1.10	3.28	2970	3.86	60.34	27536
2013-14	1.42	20.25	14219	1.04	2.67	2578	3.65	53.30	24797



Source: Directorate of Agriculture, Assam and directorate of horticulture & FP, Assam

From the above table it is seen that the production and productivity increases in case of horticulture crops- fruits, vegetables and spices which implies the prospects of increasing productivity of crops.

3. PROFILE OF THE SAMPLE DISTRICT

The district is situated in central part of Assam and it is considered to be plain. It is situated on the northern side of the river of Brahmaputra. The district is bounded by Arunachal Pradesh in the south, Bhutan and Udalguri district in the North, The district Sonitpur and Kamrup are in the east and the west of Darrang district respectively.

The economy of Darrang district is mainly agriculture based. With the area 1850.58 sq km, the district is rich with sizable production of vegetables. The climate of the district is congenial and the soil is very fertile for cultivation. The main economy of the district is agriculture based where 85 % is engaged in agriculture and allied activities.

4. Study Marketing channels: Traditional marketing channels and emerging marketing channels and its price spread from farmers to consumers

This study is about the marketing of vegetables which are perishable in nature. So the involvement large numbers of middlemen such as trader, faria, retailer, wholesaler in traditional marketing channels will be studied. Due to prevalence of large number of intermediaries, the price spread between producer and consumers become larger and producer get less than actual price. The traditional marketing channels can be defined as that type of marketing channels in which a large number of middlemen are involved, marketing efficiency is less and producer get less than actual price. The traditional Channels for ridge gourd, cucumber in Darrang district of Assam are explained below-

Channel 1: Producer- commission agent – wholesaler- retailer-consumers

Channel 2: Producer—Faria-(trader) - wholesaler-retailer- consumer

Emerging Marketing channels are those marketing channels in which the farmers can sell directly to the food processing industry, private players, self help groups, and ultimate consumers. These type of marketing such as direct marketing, contract farming ensures mutually agreed price and assured sale of the product. Producer's share in consumer rupee is higher, involvement of marketing intermediaries is very less. This channels ensures fair return, It improves credit facilities, helps in growing up some products under direct marketing. The direct marketing which is considered as one type of emerging marketing improves marketing efficiency and helps in increasing profit of farmers. The channel is producer to consumer.

5. Price determination process in TMC and EMC

In traditional marketing channels, lack of auction market and absence of minimum support price for vegetables, price is determined by wholesalers or commission agent which is immediate buyer of products. But in the emerging marketing channels, price is determined on the situation of the markets and quality of the product.

In this study we want to study the benefit of producers, Intermediaries, consumers and price spread of horticulture crops and its marketing efficiency. We also want to study the economics of cultivation in traditional marketing channels. In this study the small and marginal farmers are taken into consideration since in the markets the small and marginal farmers are highly exploited.

6. ECONOMICS OF CULTIVATION

Particulars	cucumber	Ridge gourd
Total production(qntl)	38.65	100.51
Total marketed(Qntl)	38.66	97.51

Total production cost in Rs	15843.20	17640.23
Total farmer's cost in Rs	20759.69	29095.65
Total farmer's sale(Rs)	38060	127093
Farmer's margin per qtl(Rs)	459.81	975.01
BCR(grossreturn/total production cost	2.4	7.2

Collected from sample survey

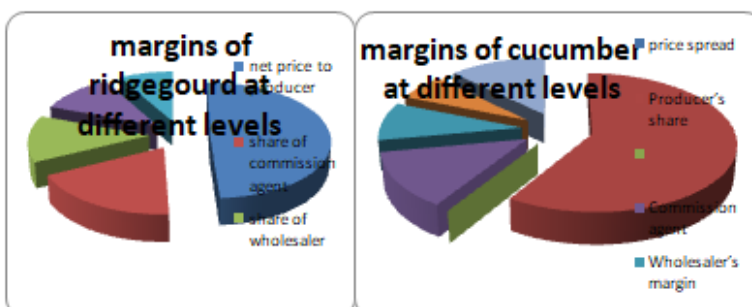
7. PRICE SPREAD OF VEGETABLES

The price spread become larger in traditional marketing channels .The price spread can be estimated by involvement of intermediaries . The price spread of vegetable crops in both traditional marketing channels are as follows-

- a. **Price spread of ridge gourd and cucumber in channel 1(Farmers-commission agent- wholesaler- retailer- consumers)** is explained below

Sl no	Item cost and market functionaries	Average price of ridgegourd (per quintal)	Margin at different level	Percentage share	Average price of cucumber (per quintal)	Margin at different level	Percentage share
1.	Net price to the producer	1000	1000	45.45	800	800	55.17
2	Commission agent's marketing cost Labour charge Transportation cost Weighting cost Storage cost Wastage	25 10.00 5.30 3.20 5.50 1.00	25	1	22 7.20 4.60 3.20 5.00 2.00	22	1.5
3	Commission agent's selling price or wholesaler's purchase price	1400	375	17.04	1000	178	12.22
4	Wholesaler's marketing cost Labour charge Transportation cost Weighting cost Storage cost Marketing fee Wastage	136.00 60.00 50.00 5.30 5.00 10.00 5.70	136	6.18	123 50 40 4.30 4 20 4.70	123	8.48
5	Wholesaler's selling price or retailer's purchase price	1800	264.00	12	1250	127	8.78
6	Retailer's marketing cost Labour charge Transportation cost Weighting cost Storage cost Market fees other expenses	171 80.00 60.00 5.20 5.00 10.00 10.80	171	7.7	127 40 60 5.40 5 10 6.60	127	8.78
7	Retailer's selling price	2200	229	10.00	1450	73	5.03
8	Total			100	1450		100

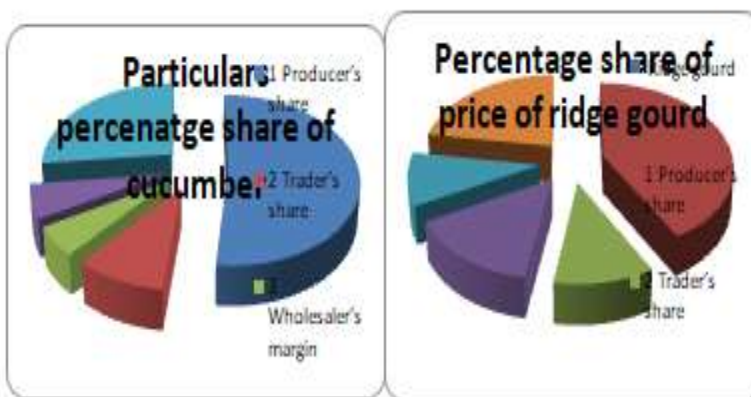
From the above it is seen that the share of producer in sale of ridge gourd, cucumber and are 45.45, 55.15 . The shares of commission agent of ridge gourd, cucumber and bhindi are 17.04 and 12.22 and 16.22 respectively. The share of wholesaler in sale of ridge gourd is 12 and it is 8.78 percent in sale of cucumber Retailer's share is 10, 5.03 in sale of ridge gourd and cucumber respectively. The share of farmers, intermediaries in the consumer price in different crops can be explained with the help of diagrams-



b. Price spread of vegetable crops in traditional marketing channel 2 (Producer—(trader) – wholesaler-retailer- consumer)

S/No	Item cost and market functionaries	Average price of tomato	Margins at different level	Percentage share	Average price of tomato	Margins at different level	Percentage level
1.	Net price to the producer	920	920	41.81	750	750	51.72
2	Producer's marketing cost Labour charge Transportation cost Development cost Storage cost Marketing fee wastage	130 60 50 10.00 4.30 3.20 2.50	130	5.9	111 40 36 5.30 5 20 4.70	111	7.6
3	Trader's selling price or	1400	237	10.77	1100	139	9.58
4	Wholesaler's marketing cost Labour charge Transportation cost Storage cost Marketing fee Wastage Other expenditure	145 60.00 40.00 5.00 20.00 10.00 7.00	145	6.59	95 40.00 20.00 5.60 20.00 4.20 5.20	95	6.55
5	Wholesaler's selling price or retailer's purchase price	1870	325	14.7	1275	80	5.51
6	Retailer's marketing cost Labour charge Transportation cost Weighting cost Storage cost Market fees other expenses	109 40.00 40.00 5.00 10.00 10.0 4	109	4.95	81 30.00 20 5.00 10.00 10.0 6.00	81	5.58
7	Retailer's selling price	2200	221	10	1450	94	6.48
8	Total					1800	100

Collected from sample survey



From the above table it is seen that the share of producer in sale of ridge gourd and cucumber, are 41.71 percent and 51.72 respectively. The shares of trader are 10.77 and 9.58, the share of wholesaler are 14.7 and 5.51, the share of retailer's are 10.00 and 6.48 in the sale of ridge gourd and cucumber. In Darrang district there is not so much prevalence of direct marketing so its price spread is not taken into account.

b. Price spread of vegetables in traditional marketing channel 1 and 2:

	Price spread in Traditional marketing channel 1 in percent			Price spread in Traditional marketing channel 2 in percent	
Share of price	Ridge gourd	cucumber		Ridge gourd	cucumber
Producer's share	45.45	55.17	Producer's share	41.71	51.72
Commission agent	17.04	12.22	Trader's margin	10.77	9.58
Wholesaler's margin	6.18	8.48	Wholesaler's margin	14.7	5.51
Retailer's margin	12	5.83	Retailer's margin	10.00	6.48
Total cost of marketing	7.7	11.82	Total cost of marketing	22.59	26.68
Consumer's rupee	100	100	Consumer's rupee	100	100



d. The marketing efficiency in traditional marketing channel in traditional marketing channels

Sl no	p a r t i c u l a r s	Traditional marketing channel 1		Traditional marketing channel 2	
		Ridge gourd	cucumber	Ridge gourd	c u c u m b e r
1	Retailer sale price	2 2 0 0	1 4 5 0	2 2 0 0	1 4 5 0
2	Total marketing cost in Rs/ qnt	3 3 2	1 7 2	4 9 7	3 8 7
3	Total net margin of intermediaries	8 6 8	3 7 8	7 8 3	3 1 3
4	Net price received by farmer in Rs/qntal	1 0 0 0	8 0 0	9 2 0	7 5 0
5	Value added in Rs/qntls	1 2 0 0	6 5 0	1 2 8 0	7 0 0
	M M E r a t i o	0 . 8 3	1 . 2 3	0 . 7 1	1 . 0 7

From the above it is seen that the modified marketing efficiency of ridge gourd, cucumber are 0.83, 1.23 in traditional marketing channel 1 and modified marketing efficiency of ridge gourd, cucumber are 0.718 and 1.07 in traditional marketing channel 2 respectively.

8.Price spread of vegetables in emerging marketing channel (direct marketing)

Price spread of the vegetables crops in direct marketing is between producer and consumer.

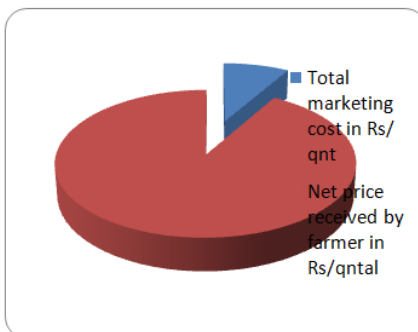
Price spread of ridge gourd and cucumber in emerging marketing channel is explained below

Sl no	Market particulars	Rs per qntl in ridgegourd	Difference level	share	Rs per qntl in cucumber	Difference level	share
1.	Net price to the producer	2000	2000	90.91	1310	1310	90.34
2.	Farmer's marketing cost	200	200	9.09	140	140	9.66
	Labour charge	80			50		
	Transportation cost	70			50		
	Development cess	10			6		
	Marketing fee	20			20		
	Storage cost	4.50			4.20		
	wastage	6.30			6.00		
	other expenditure	9.20			3.80		
3.	Producer's selling price	2000	2000	100	1450	1450	100

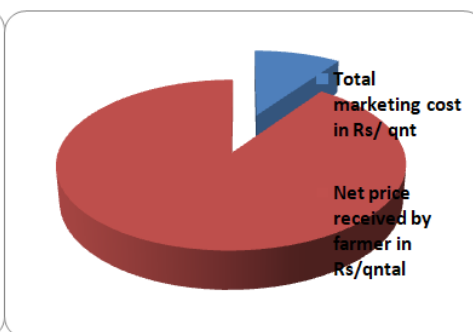
From the table it shows that the share of producer in emerging marketing channel in 90.01 and 90.34 in ridge gourd and cucumber respectively. The share of marketing cost is 9.62 and 9.69 in direct marketing between producer and consumers. It can be explained with the help of diagrams.

Diagram of price spread of ridge gourd and ridgegourd in direct marketing are explained below-

a. Price spread in ridgegourd



b. price spread in cucumbe rd



9.The total share of consumer price and marketing efficeincy in emerging marketing channel

Sl no	particulars	Ridge gourd	Cucumber
1	Retailer sale price	2200	1450
2	Total marketing cost in Rs/ qnt	200	140
4	Net price received by farmer in Rs/qntal	2000	1310
5	Value added in Rs/qntls	200	140
	MME ratio	10	9.35

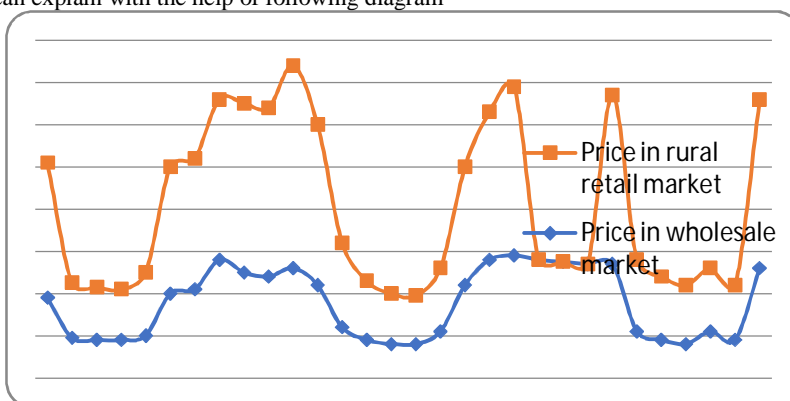
In emerging marketing channel the modified marketing efficiencies are 10, 9.35, 10.33 and 9.22 in the sale of ridge gourd and cucumber respectively.

10. There is spatial price dispersion of tomato between wholesale price and rural price. This can be explained with the help of a table-

time	Price in wholesale market	Price in rural retail market
January 2014	1900	3200
February 2014	950	1300
March 2014	900	1250
April 2014	900	1200
May 2014	1000	1500
June 2014	2000	3000
July 2014	2100	3100
August 2014	2800	3800
September 2014	2500	4000
October 2014	2400	4000
November 2014	2600	4800
December 2014	2200	3800
January 2015	1200	2000
February 2015	900	1400
March 2015	800	1200
April 2015	800	1150
May 2015	1100	1500

June 2015	2200	2800
July 2015	2800	3500
August 2015	2900	4000
September 2015	2800	0.00
October 2015	2750	0.00
November 2015	2700	0.00
December 2015	2700	4000
January 2016	1100	1700
February 2016	900	1500
March 2016	800	1400
April 2016	1100	1500
May 2016	900	1300
June 2016	2600	4000

We can explain with the help of following diagram



11.PROBLEMSOFRURAL AGRICULTURAL MARKETING :Agricultural Marketing is a complex phenomenon . There are different types of problems in the marketing of agricultural product. The functional aspects of problems are concerned with bottlenecks involved in transaction during grading, pricing, payment and other market operations. The problems prevailing in rural agricultural marketing are explained below-

A. Absence of proper transport facilities- There are some constraints related to physical access of markets. The problems are related to bad connections of roads which increase transport cost and retail price to a higher rate.

B. Absence of proper telephone and mobile facilities- Markets are poorly linked with telephone and internet facilities. Only 45% of market is linked with telephone facilities and rest of markets has no access of information and communication technology. In Assam, only 85 markets are connected by telephone and 3 are conveyed by email.

C. No knowledge about pricing- Farmers have no knowledge about what they should ask for products during transactions. Few educated farmers keep in mind the cost of production, cost of transportation while negotiating in the market. 64 % of farmers are not able to decide sell on a certain price.

D. Unavailability of agriculture credit at proper sense- There is no proper availability of agricultural credit to farmers in Assam. 22 districts remain under banked. Per capita credit disbursement to farmers was Rs 91 only in Assam.



E. Lack of proper trading facilities- Traders place vegetables in smaller quantity are even retailed by farmers themselves on the market day. Itinerant traders are common in selling paddy that collect them and sell to the market directly.

F. No authorized commission agents- In haats only unauthorized middleman operated as buyers who neither maintains a document nor issue any receipt which makes markets non transparent.

G. Lack of proper marketing information- Marketing information on commodity markets arrivals and suppliers are much important for small and marginal farmers. The low level of literacy and lack of proper market information leads to loss of income and exploitation of farmers by middleman. 40 % of farmers are aware that transportation cost must be included in pricing.

These problems are prevailing in horticulture marketing of Assam.

CONCLUSION

The main aim of rural agricultural marketing is to develop the rural economy and reduces poverty. From this study it is seen that in traditional marketing channel 1, the share of producer in sale of ridge gourd and cucumber are 45.45 and 55.15. The shares of commission agent of ridgegourd and cucumber are 17.04 and 12.22, the share of wholesaler in sale of ridge gourd is 12 and it is 8.78 percent in sale of cucumber. Retail's share is 10 and 5.03 in sale of ridge gourd and cucumber respectively. In study of traditional market channel 2 it is seen that the share of producer in sale of ridge gourd and cucumber, are 41.71 percent and 51.72 respectively. The shares of trader are 10.77 and 9.58, the share of wholesaler is 14.7 and 5.51, the share of retailer's are 10.00 and 6.48 in the sale of ridge gourd and cucumber. That means price is spread at a high rate and producer get less price than actual price. But due to adoption of direct marketing, farmers get actual price of their products and marketing efficiency increases. Though direct marketing system is introduced, it is not popularized in Assam. It is applicable only in a few districts.

So Government should implement some measures to improve marketing conditions of most districts of Assam. Suitable marketing system, innovative and creative approaches must be implemented so that it brings fruits to sweat of the farmers and ensures farmers fair prices. Proper physical infrastructures and effective distribution system must be provided so that produce must be reached to ultimate user at right time and minimum cost. Effective land reform must be implemented as they are assets of the farmers. The price information system should be strengthened and illiteracy of consumers should be reduced for proper development of rural agricultural marketing system of Assam.

Suggestions: These are some suggestions regarding improvement of agricultural markets of Assam so that the economy of Assam can be developed. These suggestions are explained as follows:

1. Developing effective farmers linkage to supply chain- The market system in Assam is very much fragmented in vegetables markets, there are 4 or 5 intermediaries in the supply chain. Farmers do not aware about marketing skill, do not receive market information. So marketing skill has to be developed so that they get actual price for their product.
2. Removing asymmetry of information- The asymmetry of information can be removed through emerging marketing channels such as direct marketing, contract farming etc.
3. Dissemination of marketing information and promoting direct marketing- Farmers have to be properly informed about prevailing retail price of the product from various sources such as AGMARKNET, mobile, ICT. By providing Kissan call centre, the various types of information can be provided to the farmers. . Public private participation is also an important path to improve market information system. By promoting emerging marketing channels the



direct connection between producer and buyer can be made and enable farmers to get adequate price.

4. Improving marketing infrastructure- The marketing system can be developed by improving market infrastructure such as provision of cold storage and go down facilities, developing forward and backward linkage and providing facilities for grading, standardization, packaging etc to improve quality of the product.

Thus these are ways to improve and promote the rural agricultural market which help in reducing the number of intermediaries and helps in getting adequate price to the farmers.

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ADDRESSING SUBSTANCE ABUSE IN ADOLESCENTS: CONCERNS AND CHALLENGES IN SCHOOL SETTING

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Abstract

During the turbulence of adolescence, substance abuse is one the ways to deal with the dilemma of their multiple needs. School Management, Administrators, Teachers and Counsellors in collaboration with the parents and significant others have an important role to play at this time. This article focuses on strategies in which these adolescents may be helped with a team approach. Some other issues which are addressed here pertain to the challenge of the effective use of multidimensional approach for school counsellors; complications of recognizing and addressing such concerns at school level leading to prevention and intervention of substance abuse. The article also emphasizes the need of collaborative approach to this dilemma by community stakeholders, parents, teachers and school administration.

Key words : Substance Abuse, Adolescents, School Administration

Introduction

Today's youth suffer from the malady of substance abuse right from school age onwards. Studies done by 2007 National Survey on Drug Use and Health (NSDUH), an annual survey Which is sponsored by the Substance Abuse and Mental Health Services Administration [SAMHSA] (2008), and the annual Monitoring the Future survey (Johnston, O'Malley, Bachman, & Schulenberg, 2008) have pointed towards the fact that indicate that substance abuse is seen to be more prevalent among adolescent population.

American School Counselor Association (2008), emphasized that the administrators and school management need to realize as educators with a serious mental health orientation, school counselors are among the first level of personnels who are in a unique position to detect, identify, and finally, in a better position to monitor and prevent adolescent substance abuse. In such a scenario, it is imperative for school counselors to rightfully comprehend the concerns, challenges and complexities associated with trying to identify and address the issue of adolescent substance abuse in schools.

Also, its important that the screening tools for substance abuse be identified and measures along with interventions required for such issue be dealt with in a patient and calm atmosphere despite the provocation to the contrary.(Beyers et al, 2005). The significance of synergy to collaborate as one among community stakeholders, teachers,



parents and administration cannot be emphasized enough in this scenario. (Evans et al 2007)

Challenges of Addressing Substance Abuse in Schools

Its challenging and perplexing while addressing substance abuse amongst adolescents and especially in a safe school environment. There are many inbuilt barriers in the school system and society which need to be understood to be properly dealt with before school students can be effectively assisted with by the counsellors (Finn et al 2006, Puri et al 2017))

Parental compliance and cooperation

Student's beliefs are influenced by several factors such as media, parental control , perceived parental support, personal issues, academic issues and of course school policy also plays a role (Beyers, Evans-Whipp, Mathers, Toumbourou, & Catalano, 2005). School management's take on the prohibited behavior, severity of punishment ; how much and when to inform the parents and overall philosophy of school does play its own role. (Beyers et al.).

Generally parents are not really involved in the development of several drug related school policies. This is the harsh reality and cannot be denied, (Beyers et al., 2005). It has been seen that better cooperation of parents may ensue for better enforcement of school drug policy if the parents feel ownership and committed to the development of these policies. (Beyers et al. Puri et al 2018). Their compliance and participation is crucial as there are many evident based researcher evincing quite clearly that involvement of parents result in reduced drug intake by the students. (Evans-Whipp, Bond, Toumbourou, & Catalano, 2007).

It has been evidenced that over two-thirds of schools in the United States do have policies that define a drug-free zone surrounding the schools (Evans-Whipp et al., 2004). But statistics speak for themselves. There has been a 45% increase in the drug intake for school (Finn & Willert, 2006).

Thus, the million dollar question will be if zero tolerance policy perspective will be helpful in preventing and reducing student drug abuse. (Evans-Whipp et al., 2007) Paradoxical researches evince various reactions. Like, in a study which examines teachers' reactions to student drug use, Finn and Willert (2006) found that they were not confident of the effectiveness school drug policies in their schools. It is indeed surprising and alarming that Approximately, 81% of teachers reported they have felt that their students at some point had been under the influence of drugs or alcohol even when attending classes during during school's official hours (Finn & Willert).

Another paradoxical study by Yamaguchi, Johnston, & O'Malley, 2003 evince that even when students were tested regularly for drug usage, it did not really deter them for further drug usage. Apparently no correlation was found between percentage of testing and drug usage. However, it is unclear if this discourages student drug use. These



findings do imply that it will be in the fitness of things if school systems should not really rely solely on drug testing to prevent drug use among adolescents.

Substance Abuse Training

It is true that school personnel which include counselors, administrators, and teachers who are often faced with indomitable challenges related with substance abuse amongst school students. Yet, Unfortunately, it is seen that they are not adequately trained to identify, suitably address, or even assist substance abusing adolescents.

For example, Burrow-Sanchez, Lopez, and Slagle (2008) in their work, indicated that often middle school counselors felt that they lacked competence in some specific areas pertaining to substance abuse especially in the areas of screening, assessment, individual and group counseling interventions and family counseling. Also, 41% participants replied in negative when asked if they had received some sort of training related to management of substance abuse in the last three years.

In a similar pattern, Finn and Willert (2006) also found in their work that few school teachers had actual knowledge about or appropriate training as to the correct way in which to respond to drug use among students. It was found that in the sample of 103 middle school and high school teachers, only 16% reported that their school had a training program specific to drug prevention.

In addition to inadequate in-service substance abuse training opportunities, unfortunately it was evinced that many teacher training programs lack substance abuse courses in their curriculum.

In their national study, Burrow-Sanchez and Lopez (2009) surveyed a sample of 286 high school counselors about their preparation and training needs for working with student substance abuse problems. On an average, the participants disagreed that their counseling graduate education had provided them with adequate training related to substance abuse.

In addition, 50% of the school counselors indicated not taking a course in substance abuse in graduate school, 31.8% reported taking one course, 12.6% indicated reporting taking two courses, and 5.2% indicated taking three or more courses. This facet of the study has an important implication of community stakeholders.

Recognizing and Assessing Adolescent Substance Abuse

It is suggested that by virtue of their availability and daily contact with their students, professional school counselors are in a better position to be able to recognize and act on substance abuse problems of students (Lambie & Rokutani, 2002). Researchers continue to suggest that of school faculty, staff, and administrators, it is the school counselors whom students seek out more mental health services (Burrow-Sanchez et al., 2008).



Thus, it is in the fitness of things that in order to effectively address the needs of substance abusing students, it is the need of the hour that that school counselors be adequately prepared to identify, assess the extent of substance abuse and manage it appropriately.

Risk Factors and Indicators

Researches have recognized that some of the risk factors for substance abuse, include an unstable family atmosphere, dysfunctional family structure and associating with other substance abusers (Lambie & Rokutani, 2002).

Other risk factors have been evinced as low self-esteem and low academic motivation as well as negative attitudes toward school (Ludden, 2007). Prevalence of a coexisting mental health disorder also denotes a risk factor which should not be overlooked. substance abuse among students is also identified by certain behaviors. For example, students may have increased trouble in social interactions with others, showing more aggressiveness and displaying an overall decrease in coping mechanisms and social skills (Griswold, Aronoff, Kernan, & Kahn, 2008).

School challenges may include low academic performance, low motivation, school absenteeism (Griswold et al.) skip classes on a regular basis (Lambie & Rokutani, 2002). The student's grades decline rapidly (Ketcham & Pace, 2003). A student may additionally appear distracted, unable to focus and concentrate in class, continues staring into space and seeming unable to focus (Ketcham & Pace). Overall, the student will appear to be withdrawn from his teachers, peers, and other school staff (Lambie & Rokutani).

Substance Abuse Screening

Ideally, the first step include use screening tools to identify substance abuse followed with collaborating with parents and community resources to provide proper assessment for students (Burrow- Sanchez et al., 2008).

Various screening tools are available which are meant to assist school counselors for assessing identifying and referring substance abusing adolescents for further treatment. One such effective screening tool is the CRAFFT questionnaire, a test for adolescent abuse, which has proven to be time efficient and consistent (Griswold et al., 2008). The questionnaire asks the adolescent a range of questions from "Do you ever use drugs to relax?" to "Have you gotten into trouble while you were using alcohol or other drugs?" (Griswold et al., p. 334). Answering "yes" to two or more questions suggests that a significant problem with substance abuse exists.

Another effective assessment tool is the Problem-Oriented Screening Instrument (POSIT) which screens for problems in a range of areas including substance abuse, and can be obtained from the National Clearinghouse for Alcohol and Drug Information (Burrow- Sanchez et al., 2008).



Another very effective screening tool that school counselor may use is the CAGE Questionnaire, which is very simple, brief and a precise tool to use. The CAGE consists of only four questions for adolescents over the age of 16 (Didgen & Shea, 2000). For example, the counselor may ask the student if he or she has ever felt the need to “cut down” on his or her drinking (Erford, 2007, p. 296). Interpretation is fairly simple too. If the adolescent answers “yes” to any of the questions, he is then referred for further detailed assessment (Glidden-Tracey, 2005).

Adolescent Substance Abuse Prevention

There is a common saying that “Prevention is better than cure”. Researches have consistently indicated that Those adolescents who do not use substances during adolescence will be less likely to use during adulthood (Caulkins, Pacula, Paddock & Chiesa, 2002, Thaker et al., 2007).

MacKinnon et al. (1991) researched a program which was found to be Very useful in prevention of drug use among students. Their study assessed the effectiveness of a drug prevention program in several Kansas City schools. This program consisted of a total of 10 sessions that addressed content such as assertiveness and problem solving. It was found that schools that utilized the drug prevention program had lesser number of students currently on drugs and fewer students reported interest in using drugs in the future. Also, it was seen that these schools had lesser students believe that it would be distressing to talk to their friends about drug use when compared to schools that did not have the drug prevention program in place (MacKinnon et al.) This study has larger implications for community stakeholders.

Thus, it is evinced very clearly that drug prevention programs if implemented properly do play a vital role component of drug use prevention amongst students.

It is equally important part of drug prevention is in making sure that professional school counselors are appropriately trained about current trends that are popular among children and adolescents. For example, a recent popular trend that adolescents are participating in is called *pharming* (Watkins, Ellickson, Vaiana & Hiromoto, 2006).

This is when different types of illicit pills such as Ecstasy are combined in a bowl with a variety of prescription pills such as Xanax. In this scenario, professional school counselors need to understand these issues scientifically to explain the harmful effects of drugs especially when combining different substances (Watkins et al.).

Adolescent Substance Abuse Interventions

Multimodal eclectic approach is required to address the issue of substance abuse for adolescents. Each intervention provides a specific framework with a unique scope, purpose and benefit to this population. The most pertinent of these are :
Multidimensional family therapy, school-based programs, and 12-step support



programs and more recently OAM (Optimism Attitude Model Banerjee and Puri 2017) They have been elucidated here.

Multidimensional Family Therapy

Present researches have focused on the importance of contextual influences which Influence adolescent substance abusers (Liddle, Rowe, Dakof, Henderson, & Greenbaum, 009). Hence, interventions which are community-based have increased in popularity.

Such an intervention is exemplified in Multidimensional Family Therapy (MDFT). This intervention is an “integrative, family-based, multiple systems orientation treatment for adolescent drug abuse and related problems” (Liddle et al., 2009, p. 16). This intervention has also been found to be effective with geographically and ethnically diverse populations (Liddle et al., 2006). Another benefit is that , MDFT can be used in a variety of settings, including office, in-home, brief, intensive outpatient, day treatment and residential treatment (Liddle et al., 2009).

School-Based Programs

Substance abuse interventions which are implemented within the school setting does possess A definite advantages over the traditional modes of treatment, including providing direct access of care to those who need it and improvements within various domains of functioning (e.g. school, emotional distress, and family relations) (Tubman, Wagner, Gil, & Pate, 2002). Another added benefit of a model within this special setting is the various domains to which one can intervene, such as “individuals, classrooms, existing social groups, purposely assembled group, the entire school, or any combination of the foregoing” (Wagner, Tubman, & Gil, 2004, p. 107).

One of the more popular school-based interventions for adolescents with substance abuse problems can be found in the Student Assistant Program (SAP) (Wagner et al., 2004). The SAP is modeled after the Employee Assistance Program (EAP), which is used in businesses to maintain an optimum level of production by employees. According to Wagner et al., in addition to serving thousands of schools, the SAPs “provide mechanisms for early identification of individuals with alcohol and/or other drug abuse problems and methods for secondary and tertiary prevention” (p. 111).

Another school-based intervention, project CHOICE, has shown to lower rates of alcohol use by adolescents as well as lower perceptions of use of alcohol and marijuana by schoolmates (D'Amico & Edelen, 2007). This intervention included five sessions, which repeated throughout the school year and included such components as “normative feedback, challenging unrealistic positive expectancies, resisting peer pressure to use substances through the use of role-playing, and discussing coping strategies” (D'Amico & Edelen, p. 593).



Although research on these interventions especially in other countries like India is in the infancy stage, there is some evidence that school-based interventions for adolescents with substance abuse problems does hold promise for the future. (Robinson et al.).

12-Step Programs

The history and popularity of 12-step programs for substance abuse treatment is quite well known. Alcoholics Anonymous (AA) is the most commonly utilized mode of help for alcohol-related problems in the general population (Kelly, Myers, & Brown, 2002). They have been found to be treatment of choice even for adolescents with good results. (Winters, Stinchfield, Latimer, & Lee, 2007).

In one study, adolescent attendance at AA meetings had resulted in a reduction of substance use after six months as well as increases in abstinence-focused coping skills and motivation (Kelly et al.).

Another model – Minnesota model “combines the principles of the Twelve Steps of Alcoholics Anonymous and basic principles of psychotherapy, with the goal of abstinence from all drugs and alcohol” (Winters et al., 2007, p. 64).

More specifically, treatment components consist of individual, group, and family counseling, lectures about the 12 steps of AA, reading and writing assignments centered on AA philosophy, and occupational and recreational therapy (Winters, Stinchfield, Opland, Weller, & Latimer, 2000).

OAM – Optimism Attitude Model

OAM developed by Banerjee 2017 is a very efficacious form of therapeutic model which utilizes the individual's need for self efficacy – which all of us have in varying degrees but are not able to achieve the same. In simple steps, OAM integrates the seventh sense hypnotherapy in dealing with individual's inner demons and emerging out victorious. The sixth sense in an individual has been traditionally seen as having the ability of prophetic intuition. Seventh sense is the development of Optimism in the individual whereby the individual is able to develop coping abilities to for competency mapping and resilience whenever faced with uncertainties of life.

Optimism Attitude model comprises of six steps process which includes

- Creating Awareness
- Visualization (Scenario building)
- Reconstruction (cognitive priming)
- Reinforcement (Mindfulness)
- Attitude formation (Optimism)
- Self-efficacy

Collaboration



School counselors do not work alone. (Conye & Mazza, 2007). The target population should also consist of those at risk for substance abuse. School counselors should consult and collaborate within and outside of the school in order to prevent and to treat students with substance abuse issues.

This collaborative practice is mandated in the American School Counselor Association's (ASCA) National Model, which encourages school counselors to "engage in leadership, advocacy, collaboration and teaming" (Conyne & Mazza, 2007, p. 20). In addition, ASCA's National Model emphasizes "bridging counseling and academic achievement via systemic and collaborative efforts" (Holcomb-McCoy, 2007, p. 4).

Collaboration with Teachers

It is very important that the counselors work alongside teachers in identifying those at risk as also detection, assessment and referral of adolescents with substance abuse issues currently and even those who have abused these substances in the past. Indubitably, teachers do play an important role in combating drugs within the school (Finn & Willert, 2006).

School counselors need to capitalize on strengths and resources which teachers can provide and together they can encourage, recognize, and train teachers in their prevention efforts as they partner with them to help students. When students feel that their teachers are concerned about them, they will be less prone to substance use and abuse (Council on School Health and Committee on Substance Abuse, 2007). In addition, if teachers model resistance to drugs, their students will be more likely to resist peer pressure for substance abuse (Suldo, Mihalas, Powell, & French, 2008).

Collaboration with Community Stakeholders

Apart from capitalizing on resources within the school, it's imperative that a collaboration with community agencies around the school also need to be struck. In addition, school counselors may rely on community agencies to support and assist with their substance abuse programs, staff development, and education. Agencies might also have positive, anti-drug alternative opportunities for students out of school who might otherwise become involved in substance abuse activities. Therefore, they can reach students outside of school operating hours (Council on School Health and Committee on Substance Abuse). A collaboration with community stakeholders put the school administration in a strengthening position and a collaborative handshake will help a long way in dealing with adolescents who are in their own hell of substance abuse.

Conclusion

School is not about repairing all social evils. Schools can, of course, influence such behaviour. The way they do it is through the development of knowledge and skills and the cultivation of values in their students.



Substance use before the age of 17 increases the probability of social damage associated with substance use at later ages by five times. Hence the adult response to first time exposure to substance use in young ages has to be prompt and learned. Such Screening and Brief Interventions and Substance Use Prevention Programs through schools have been proven to be effective in research settings.

Nothing may be achieved singly and working as a team will go a long way in ameliorating the distress which the adolescents in their turbulence undergo to relieve themselves of their inner turmoil – by going deep into the hell hole of depression and substance abuse.

The present effort has been an attempt to cite evidences from professional literature to emphasize that , substance abuse among adolescents is very much a prevalent, but complex issue to address whose existence cannot be denied. In addition to being familiar with risk factors, professional school counselors must strive to have a clear understanding of available assessment tools, preventive measures, interventions, and collaborative resources that exist.

Additionally, it is imperative that professional school counselors stay up to date on the different street names for drugs as well as new ways children and adolescents are experimenting with drugs. Having a more comprehensive and thorough understanding will allow professional school counselors to play an active and vital role in responding to the needs of substance abusing adolescents.

Keeping update with the latest psychotherapeutic techniques like seventh sense hypnotherapy in the management of adolescents with substance abuse is also another way in which collaborative work may be accomplished by psychiatrists, psychologists, social workers, medical personnel, school administrators, teachers parents and community stakeholders “ for the sake of the children”.

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CHEMISTRY OF CORONAVIRUS- 19

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Abstract:

Coronavirus disease (COVID-19) is an infectious disease caused by a newly discovered coronavirus .Most people infected with the COVID-19 virus will experience mild to moderate respiratory illness and recover without requiring special treatment. Older people, and those with underlying medical problems like cardiovascular disease, diabetes, chronic respiratory disease, and cancer are more likely to develop serious illness. The best way to prevent and slow down transmission is be well informed about the COVID-19 virus, the disease it causes and how it spreads. Protect yourself and others from infection by washing your hands or using an alcohol based rub frequently and not touching your face. Coronavirus disease (COVID-19) is an infectious disease caused by a newly discovered coronavirus .Most people infected with the COVID-19 virus will experience mild to moderate respiratory illness and recover without requiring special treatment. Older people, and those with underlying medical problems like cardiovascular disease, diabetes, chronic respiratory disease, and cancer are more likely to develop serious illness. The best way to prevent and slow down transmission is be well informed about the COVID-19 virus, the disease it causes and how it spreads. Protect yourself and others from infection by washing your hands or using an alcohol based rub frequently and not touching your face.

Key word: COVID-19, cardiovascular, diabetes, chronic, transmission

An Official Name for the Virus

There is currently no official name for the virus. Some Chinese researchers call the disease NCIP or novel coronavirus–infected pneumonia. The World Health Organization has proposed calling the illness “2019-nCoV acute respiratory disease”. They suggested the virus be called “2019-nCoV”. The “n” stands for the word novel while the “CoV” stands for coronavirus. The International Committee on Taxonomy of Viruses will decide the official name of the virus.

The Virus Seems To Originate In Bats

Researchers studying the genetic sequence of the 2019-nCoV virus found it shares 88% of its genetic sequence with two coronaviruses originating in bats. This led researchers to conclude the 2019-nCoV virus most likely came from bats. Although bats are sold markets in China and eaten, the Huanan seafood market was not selling bats at the time of the 2019-nCoV outbreak. This suggests some other type of animal sold at the market made contact with bats, became infected and passed the virus on to humans.[18,21]

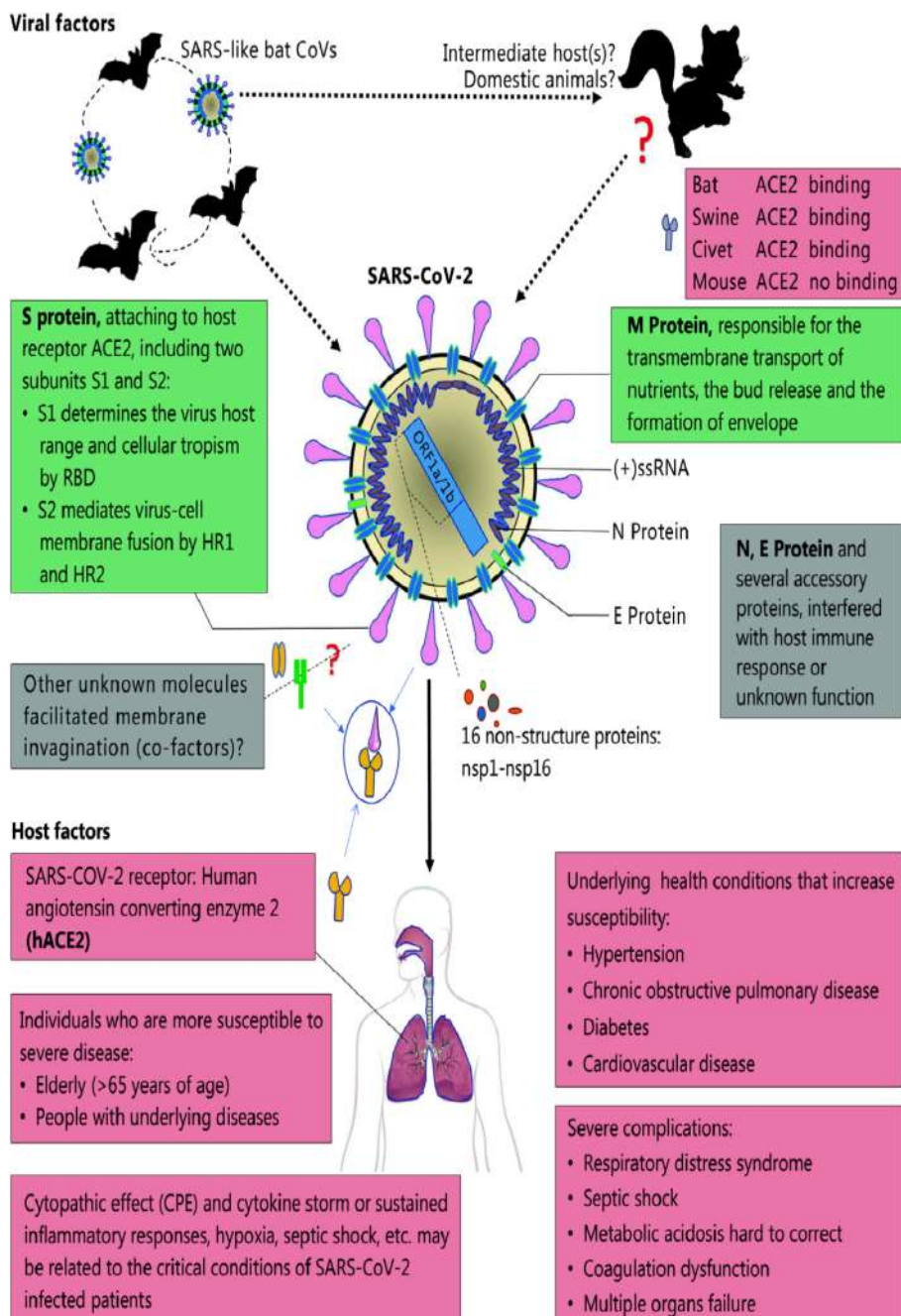


Fig-1 Corona virus Infection cycle



In 1937, coronaviruses were first identified as an infectious bronchitis virus with which birds suffered that could devastate poultry stocks. Today, the viruses are the cause of the common cold in 15% to 30% of all cases. In the past 70 years, researchers have found camels, cattle, cats, dogs, horses, mice, pigs, rats and turkeys that were infected with coronaviruses. Coronavirus disease (COVID-19) is an infectious disease caused by a newly discovered coronavirus. Most people infected with the COVID-19 virus will experience mild to moderate respiratory illness and recover without requiring special treatment. Older people, and those with underlying medical problems like cardiovascular disease, diabetes, chronic respiratory disease, and cancer are more likely to develop serious illness. The best way to prevent and slow down transmission is be well informed about the COVID-19 virus, the disease it causes and how it spreads. Protect yourself and others from infection by washing your hands or using an alcohol based rub frequently and not touching your face.[13,14,15,16,17] The COVID-19 virus spreads primarily through droplets of saliva or discharge from the nose when an infected person coughs or sneezes, so it's important that you also practice respiratory etiquette (for example, by coughing into a flexed elbow). At this time, there are no specific vaccines or treatments for COVID-19. However, there are many ongoing clinical trials evaluating potential treatments. The worldwide outbreak of coronavirus disease 2019 (COVID-19) has demonstrated that we are all part of a small world where diffusion of contagious diseases is inevitable. Although the new coronavirus originated in Wuhan seems to present lower lethality compared to previous epidemic outbreaks from other coronaviruses, its capacity of diffusion has been phenomenal. One infected individual may transmit the virus to 2 or 3 others. Of note, screening based on symptoms and signs is ineffective and asymptomatic persons can spread the disease. In the very early phases, before this wide diffusion of the virus, a call to action was published in *Lancet Respiratory Medicine* underlining the need of alertness for zoonotic virus infections crossing species and infecting human populations. In particular, recommendation was made to prepare intensive care teams to deliver extracorporeal organ support (ECOS) therapies in infected patients whose pulmonary syndromes are particularly severe. [1,2,3] Once again, despite previous experiences presented higher incidence of severe complications and lethality, the current outbreak still requires intensive care for 5% of the infected population. Among those critically ill patients, the mortality rate is 49%. Even with the specific tropism for airway epithelial cells, the infection seems to be weak in humans and transmission is likely to occur only when lower respiratory tract disease develops. COVID-19 causes mild flu-like symptoms or even no symptoms in the majority of the patients. Coronaviruses bind to receptors such as angiotensin-converting enzyme 2. Angiotensin-converting enzyme 2 is present in the epithelia of the lung, small intestine, colon, and biliary tract. In fact, viral nucleic acids were found in stools and anal swabs of patients diagnosed with COVID-19 infection. In a cohort of COVID-19-infected patients from Singapore, half (4 out of 8) of patients tested had the virus detected in stools. This might explain liver dysfunction, diarrhea, nausea, and vomiting that occurred in patients with pneumonia, namely, the gut-lung crosstalk. In a Chinese group of patients with pneumonia caused by COVID-19, 23% were admitted to intensive care unit (ICU), 17% had acute respiratory distress syndrome, and 11% died. Major preventive measures have been undertaken in specific areas where the incidence



was significantly higher, to limit the diffusion of the virus. Despite those measures, the requirement of ICU services and stations still has dramatically increased. Personal communications and early reports mostly coming from China suggest that 67% of severely ill COVID-19 patients may present with additional organ dysfunction syndromes.[4,5,6] This has been, at least in part, related to a sepsis-like syndrome induced by high level of circulating cytokines. In such circumstances, while pulmonary - exchanges are compromised and dominate the clinical scenario, acute kidney injury and heart and liver dysfunction may also become evident]. Cytokine storm may be induced by a superimposed septic syndrome or by the direct effect of the virus on the infected host. In the past, the experience matured with H1N1 influenza, SARS, and MERS has suggested that the severity of illness depended on comorbidities and the immune-competence of the individual. In severe situations, however, an uncontrolled inflammatory state or a subsequent/simultaneous immune-paralysis is the direct consequence of endocrine effects of pro- and anti-inflammatory cytokines spilled over into the systemic circulation. Of special interest, in a retrospective analysis of a German cohort of 25 critically ill H1N1-infected patients, the prevalence of virus-associated hemophagocytic syndrome (VAHS) was 36%. All patients with the syndrome had received extracorporeal membrane oxygenation (ECMO). ECMO could have been a trigger or an amplifier of cytokine activation. The pathogenesis of VAHS involves excessive production of interferon gamma and interleukin-2. VAHS itself is a prototype of a cytokine storm syndrome. In our present experience in San Bortolo Hospital, all our 4 COVID-19 critically ill patients have hyper ferritinemia, raising awareness of VAHS as a differential diagnosis. In organ dysfunction syndromes when pharmacological treatment is simply not available or efficacious, mechanical ventilation and hemodynamic support seem to be the only possible therapeutic strategy. However, extracorporeal therapies such as hemofiltration or hemoperfusion (HP) offer a new possibility to support different organs in a multiple organ dysfunction condition. Using specific extracorporeal circuits and devices, heart, lungs, kidneys, and liver can be partially replaced or at least sustained during the severe phase of the syndrome. The concept is known as ECOS. The most important technique in these cases is the ECMO mostly applied in veno-venous mode. Furthermore, extracorporeal CO₂ removal is another option that can be performed in less severe cases to facilitate a less invasive and traumatic mechanical ventilation. Although acute kidney injury in these patients is not common, continuous renal replacement therapies may offer in conditions of mild to severe kidney dysfunction a significant support for solute and fluid control. The same is true for left ventricular assist devices in case of refractory heart failure or albumin dialysis and HP in case of liver dysfunction and hyperbilirubinemia]. However, according to information collected from Chinese colleagues who faced a large proportion of patients with complicated COVID-19 syndromes in their ICUs, a significant benefit seems to have been obtained with the use of direct HP with cartridges containing highly biocompatible sorbents and microporous resins [. Such therapies, designed to remove the excess of circulating cytokines, seem to have displayed a remarkable benefit in terms of hemodynamic support and organ function recovery. The suggested scheme of application of HA380 cartridges (Jafron Biomedical Co., China) was 2-1-1, that is, 2 units utilized for 12 h in the first 24 h and 1 unit per day utilized for



24 h in the following 2 days. In Europe, we had matured some experience with the use of Cytosorb[®] cartridges (CytoSorbents Corporation, NJ, USA), exactly for the same purpose of controlling deadly inflammation in critically ill and cardiac surgery patients . This approach may be just one of many others utilizing extracorporeal therapies in these severe syndromes and will require scientific validation once the emergency of the current epidemic will be over. The suggested mechanism is the nonspecific removal of the peaks of the circulating cytokines both in the pro- and in the anti-inflammatory side. This is consistent with the “peak concentration hypothesis” suggested some time ago]. In presence of our inability to obtain instantaneous monitoring of biological levels of cytokines, the reasonable approach is to promote a nonspecific removal assuming that those cytokines with the highest concentration will be removed in higher amount . This would facilitate a return to a less severe derangement of the immune system and to an improved level of the immunological response of the host. The same concept has been expressed by the “cytokinetic model.” In this theory, the reduction of circulating levels of cytokines may allow the immune system of the patient to redirect the immunocompetent cells to the source or site of inflammation . We warn users of these techniques that together with the removal of cytokines, some drugs and antibiotics like vancomycin are also removed. In vitro models proved that. In this case, a specific adjustment of antibiotic dosage in patients with bacterial infections should be carefully planned. Another adjunctive potential extracorporeal therapy is lectin affinity plasmapheresis for coronavirus trapping. Blood runs into a plasma filter, and the filtered plasma containing viral copies passes through a matrix of lectins. There is a high affinity between the viral envelope and lectins. Likewise, some viral copies are captured and the viremia is reduced . This therapy should be further explored and validated. After a viral infection, a percentage of patients suffer from severe pneumonia. Such patients may have a systemic cytokine release due to the illness itself, to the mechanical ventilation--associated lung injury, and to the extracorporeal membrane oxygenation. This will induce endothelial dysfunction and consequent organ failure. The application of HP may contribute to reduce the burden of cytokines cutting the peaks in a nonspecific way, restoring at least in part immune-homeostasis. When hemoperfusion is combined with continuous renal replacement therapies (HP/CRRT), the effect can be further amplified and the additional task of organ support can be accomplished. TNF, tumor necrosis factor; IL, interleukin; HP, hemoperfusion; CRRT, continuous renal replacement therapy; ECMO, extracorporeal membrane oxygenation

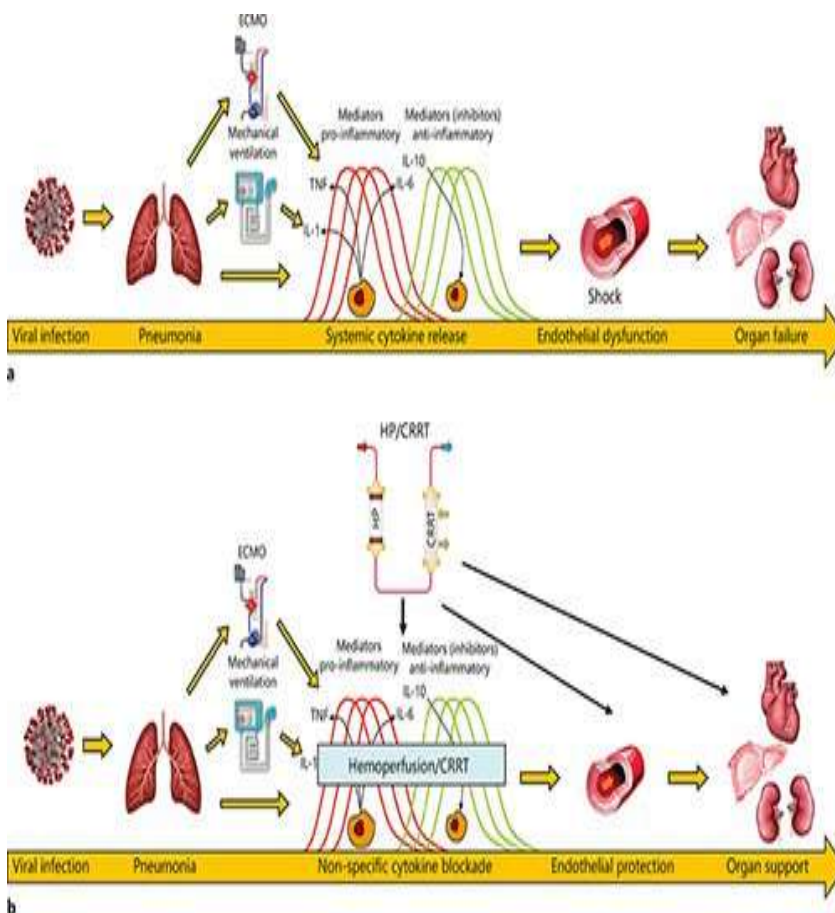


Fig -2: Harmful effects of viral infection

The main message the present editorial tries to convey is that the ICU staff and treating physicians should be familiar with the concept that extracorporeal therapies represent today an important strategy in critically ill patients with multiple organ dysfunction. Training and research should be planned to further develop skills and knowledge in this area where new membrane separation processes and adsorption techniques appear to be a new frontier in fighting the so-called “cytokine storm syndrome.” We will need to increase awareness of the basic principles, to study mechanisms, to optimize prescription and delivery of different techniques. We need to stimulate research and data collection to create sufficient scientific evidence. We need to prepare for the uncertain future where the frequency of these crises will be probably increasing. We must retool ourselves with new strategies and new therapies, and among those, new ECOS therapies. As the ancients used to say: “*Si vis pacem, para bellum*,” if you want peace, get prepared to world .Chemistry has a key role to play in understanding everything



from viral structure to pathogenesis, isolation of vaccines and therapies, as well as in the development of materials and techniques used by basic researchers, virologists, and clinicians. *ACS Chemical Biology* Editor-in-Chief, Laura Kiessling, notes that “Fundamental research to understand the molecules that govern virus structure and function can accelerate the discovery of means to treat and prevent infectious disease. Events such as the current novel coronavirus outbreak highlight the essentiality of basic research and the need for sustained research funding so that comprehensive resources exist when a rapid response is required.” This Virtual Issue provides a brief overview of the important contributions of chemistry to understanding and controlling the spread of coronaviruses. *ACS Infectious Diseases* Associate Editor and virologist, Priscilla Yang, says “This Virtual Issue shines a light on various research efforts past & present to facilitate rapid development of diagnostics and therapeutics for coronavirus, and the important role that chemistry has to play in translational discovery.” Basic Viral Structure and Mechanism of Infection Scientists have moved rapidly to characterize 2019-nCoV and widely disseminate their findings amongst the international research community as quickly as possible. One important example of this is the homology models of the novel coronavirus cysteine protease produced by Stoermer. The rapid availability of nCoV genomic data made possible the production of first-generation homology models for 3CLpro cysteine protease; an enzyme which is crucial for viral replication and has been explored previously as a target for antiviral therapies in the treatment of another coronavirus, SARS. This preprint notes that though the viral genome bears a close similarity to bat coronaviruses, the protease exhibits the closest homology with SARS CoV protease a zoonotic virus that entered the human population via civets. Huang et al. used crystallographic and biophysical methods to conduct structural and functional characterization of HKU9-RBD — a bat coronavirus that has not crossed over to humans. The rationale for these studies was that bat betacoronaviruses (a genus that includes SARS and MERS) should be well characterized in the event that they end up being the source of the next global pandemic. Upon comparison of the HKU9-RBD receptor-binding domain (RBD) to the available structures of the SARS-, MERS-, and HKU4- (another bat coronavirus) RBDs, the authors found that even though the evolutionary histories of RNA viruses tend to be difficult to determine due to substantial evolutionary pressure, the coronaviruses in this study exhibited several conserved tertiary structural features in the core subdomain of the spike (S) protein.[10,11] This spike protein, present on the virion surface, is a key factor in determining the species tropism of the virus as it is involved in receptor recognition and membrane fusion as part of the mechanism of infection. The authors concluded that their findings supported the notion that the S protein of betaCoV divergently evolves from a common ancestor, particularly in the external RBD region, and that this determines the potential of a particular betaCoV virus for interspecies transmission. Lee et al. conducted high-throughput screening of 25,000 compounds, seeking a small molecule dual inhibitor for the papain-like protease (PLpro) enzymes of MERS-CoV and SARS-CoV. The authors were able to identify a compound with inhibitory activity against both enzymes though interestingly, despite the fact that the two enzymes bear significant similarities in their overall structures and catalytic sites, the identified compound acts as a competitive inhibitor against MERS-CoV PLpro, and



an allosteric inhibitor against SARS-CoVPLpro as determined using SPR. Further, though this suggests that the inhibitor recognition specificity of the compound may differ for MERS-CoVPLpro and SARS-CoVPLpro, the inhibitor was selective for both of these over two human homologs. Two residues identified through structure and sequence alignments, Y269 and Q270 of the SARS-CoVPLpro were replaced by T274 and A275 in MERS-CoVPLpro complicating the potential for critical binding interactions. Taking this into consideration along with the finding that none of the four tested SARS-CoVPLpro lead inhibitors were effective against MERS-CoVPLpro, it is notable that a dual functionality inhibitor was identified for both of the SARS and MERS papain-like proteases. Treatment Approaches The development of therapeutics for known coronaviruses, as well as 2019-nCoV, is an active research area. A review by Morse et al. deposited on ChemRxiv discusses potential prevention and treatment options for 2019-nCoV. There are four crucial enzymes that are necessary for pathogenesis: the spike protein that facilitates virus entry through the host cell surface receptor angiotensin-converting enzyme 2, the coronavirus main protease 3CLpro and the papain-like protease PLpro that are involved in assembly of new virions, and the RNA-dependent RNA polymerase RdRp that facilitates replication of the CoV RNA genome. The authors argue that the differences between the SARS-CoV and 2019-nCoV spike protein will likely require the development of novel therapeutics. The PLpro enzymes from the two viruses only share 83% sequence identity but do not differ in their main secondary structure components that form the active site. Hence, inhibitors developed for the SARS-nCoVPLpro may also be active against the 2019-nCoV enzyme. The 2019-nCoV and SARS RdRp and 3CLpro share significant sequence identity and would make the application of previously developed small molecule therapeutics based on the SARS-CoV proteins feasible, such as remdesivir and 3LCpro-1. A more general review by Falcinelli et al. presents the importance of integrating clinical and basic research for the investigation of viral pathogens and the development of novel therapeutics. A perspective by Pillaiyar et al. provides an overview of chemotherapies developed against the SARS protease SARS-CoV 3CLpro between 2003, when the SARS outbreak occurred, and 2015. Mehellou et al. review the ProTide technology in their miniperspective, an approach that facilitates intracellular delivery of nucleoside analog monophosphates and monophosphates. The ProTide GS-5734 developed by Gilead Sciences reportedly exhibited broad-spectrum antiviral activity against a number of viruses, including coronaviruses. In their viewpoint, Schor and Einav discuss the repurposing of existing drugs as broad-spectrum agents for the treatment of intracellular pathogens and point out that kinase inhibitors, such as imatinib and nilotinib inhibit coronaviruses such as SARS and MERS. An article published in Chemical & Engineering News reports on the mobilization efforts of drug companies and biotechnology firms to rapidly develop diagnostics and treatments for 2019-CoV. Original research articles featured in this Virtual Issue include the article by Wang et al. who disclose a strategy for preparing a vaccine against SARS-CoV that involved targeting a specific epitope of the virus spike protein. Yoon et al. report the synthesis of aristeromycin analogs as dual-target antiviral compounds capable of inhibiting the RdRp proteinase of various RNA viruses and the host cell S-adenosyl-L-homocysteine hydrolase. Two articles by Kei Liu and colleagues present viral fusion



inhibitors against MERS-COV. Kvach et al. report the development of the first substrate-like APOBEC3 inhibitors as a strategy for augmenting antiviral (and anticancer) therapies. APOBEC3, an enzyme that is a component of the innate immune system, mounts an effective defense against viral infection by altering pathogen-derived genetic material and thereby rendering it non-functional. Specifically, APOBEC3 converts 2'-deoxycytidines to 2'-deoxyuridines on single-stranded DNA via deamination. Viruses have of course evolved strategies to use this mutagenesis function of APOBEC3 to their advantage or to evade it altogether. The authors investigate ssDNA that include the cytidine nucleoside analog 2'-deoxyzebularine as substrate-like APOBEC3 inhibitors; the first such platform for this application.[12] The 2019 novel coronavirus has the potential to be a global pandemic. Health officials say it originated in a market in Wuhan, China that sold live and dead wild animals that people ate for food, improved health and vitality and a number of other purposes. The virus has now been detected in Australia, Canada, Finland, France, India, Italy, Japan, Nepal, Russia, Singapore, Spain, Taiwan, Thailand, Vietnam, the United States and over a dozen other countries.[6,7,8,9] The good news is health officials around the world are being proactive in working to stop the virus from spreading. They have identified and broadcast the symptoms of the illness and have begun to quarantine people with the illness to prevent them from passing it on to others. Beginning Sunday, February 2, American citizens, permanent residents, as well as their immediate family members who have been to China's Hubei province recently or had contact with people who had, must undergo a two-week mandatory quarantine period to ensure they are not infected with the 2019-nCoV virus. One of the issues that has contributed to the spread of what health officials are calling the 2019-nCoV virus is its two week incubation period. During this time, a person may have the virus, display no symptoms of it, but can still spread it to others. This makes it difficult for people to know who has the virus and when they should take actions to protect themselves from becoming infected. This has created an extra sense of concern that the virus could quietly continue to spread. People infected with the 2019 novel coronavirus begin to experience mild cold or flu-like symptoms in two to four days. Although the symptoms can vary from one person to the next, they typically include sneezing, coughing, runny nose, fatigue, sore throat and fever. According to healthcare experts one of the simplest things people can do to protect themselves from the 2019-nCoV virus is to wash their hands regularly with soap and water after making contact with people who could potentially have it. They recommend washing hands for at least 20 seconds before touching your eyes, nose, mouth or food. Currently there's no cure for the 2019-nCoV virus. Common treatments that have proven to be somewhat effective in controlling the symptoms include taking over-the-counter medication, drinking lots of water, getting adequate rest, avoiding overexertion, not smoking, staying away from smoky areas and using clean mist vaporizers or humidifiers.

Taking medications like acetaminophen, ibuprofen and naproxen can help to reduce the pain and fever associated with the illness.

Work on a Vaccine

Currently there is no vaccine that can protect the public from this particular coronavirus strain. However, there are teams of medical researchers and scientists in Canada, China



and the United States that are working to develop a vaccine. According to the National Institutes of Allergy and Infectious Diseases, one organization working on developing a vaccine, it will take several months before a vaccine can advance into clinical trials. They anticipate a 2019-nCoV vaccine will not be widely available for about year's time.

Spreading From Person To Person

It remains unclear just how easy it is for the 2019-nCoV virus to spread from one person to another and how sustainably the transmission is ongoing. According to Chinese Health Authorities, there have been two cases of suspected human-to-human transmission. The World Health Organization recently hosted a meeting to assess the outbreak's severity. They concluded that with hundreds of people dead from the virus in Wuhan and Hubei Province, China should declare a national emergency. However, the WHO didn't feel 2019-nCoV was a serious enough threat to declare a global health emergency at that time.

Seek Medical Assistance

The WHO and the CDC are not recommending any specific health measures at this time for dealing with the 2019-nCoV outbreak. They say people who have respiratory symptoms they think is related to the coronavirus should seek medical assistance and advice. They say make the healthcare facility aware of your concerns and do not return to work, school or other group activities until you are certain the cold and flu-like symptoms are not 2019-nCoV.

Worrisome Cases and Bold Action

Health officials find 2019-nCoV cases in the U.S., Germany, Japan and Vietnam worrisome because none of the patients personally visited China. They contracted the virus by coming in contact with someone who had been to Wuhan, China. The World Health Organization is paying close attention to these human to human transmission cases. The organization praised China for its bold action in isolating 50 million people in the cities of Wuhan, Huanggang and Ezhou at the center of the outbreak to stop its spread. They shut down transportation links and placed certain cities in quarantine. The WHO called China's actions "unprecedented in public health history." [20,21]

How The Virus Spreads Among People

According to the Centers for Disease Control, in parts of China and other countries the virus is now spreading person-to-person. The CDC says the most common ways the virus spreads from an infected person to healthy people around them is when they cough or sneeze and release viral particles into the air and through touching, shaking hands and others forms of close personal contact. When healthy people touch objects or surfaces on which there are viral particles, then touch their eyes, nose or mouth before washing their hands, the virus can spread. In some rare cases fecal contamination can cause the virus to spread as well.

Potential for Becoming A Pandemic

There are three things this or any other virus must do to cause a pandemic in humans. They are:

1. Efficiently Infect Humans



2. Replicate In Humans
3. Spread Easily Among Humans

Currently it is unclear just how easy it is for the 2019-nCoV virus to spread from one person to another. To determine this scientists must calculate the virus' 'basic reproduction number'. That's the number of people on average who can catch the virus from one infected person. A recent New England Journal of Medicine article stated the estimated basic reproduction number for the 2019-nCoV virus is 2.2 people. That means each person that is infected has been spreading the 2019-nCoV virus to between 2 and 3 people. This means it has the potential to continue to spread unless public health measures stem the outbreak.

A Public Health Emergency

The World Health Organization declared on January 30, the 2019-nCoV virus outbreak is a public health emergency about which the international community should be concerned. The WHO said the primary reason for the declaration is their concern the virus could begin to spread to countries that have weaker healthcare systems. They compare the spread of the 2019-nCoV virus to the spread of SARS and MERS. All three have caused some people mild to severe symptoms of respiratory problems that have resulted in some deaths and the viruses can be transmitted through close contact.

Coronaviruses Going From Animals To Humans

In the MERS coronavirus outbreak that was first reported in Saudi Arabia in 2012, the virus was transmitted from animals to humans through touching or consuming the milk or meat from infected camels. SARS, the first cases of which were reported in Southern China in 2002, experts think was caused by bats infecting civets. Today, experts say the 2019-nCoV virus began to spread in Wuhan by people who touched or ate infected animals. MERS had a fatality rate of over 34% and SARS had a 10% fatality rate. The fatality rate for the 2019-nCoV virus is currently about 2%. The people who died were over age 60 and had pre existing conditions.

Developing Innovative Treatments

Healthcare experts are working hard to keep fatalities from the 2019-nCoV virus down by developing innovative new treatments. Currently, when people begin developing symptoms like coughing, fever, difficulty breathing, sore throats, bronchitis, pneumonia and other lower-respiratory tract illnesses, they turn to standard treatments. They include rest, medication, hot showers, humidifiers and drinking lot of fluids. However, U.S. National Institutes of Health researchers are developing a vaccine and experts at the National Institute of Allergy and Infectious Diseases are designing therapies to detect the virus and train immune cells to destroy it. They will be monitored in quarantine for 14 days to see if they show signs of the infection.

How People Can Protect Themselves

According to the Centres for Disease Control and Prevention, the best way people can prevent themselves from becoming infected with the 2019-nCoV virus is to avoid exposure to people or animals sickened with it. The CDC recommends people who are uncertain of whether or not the people with whom they have made contact have the



respiratory viruses take certain steps to prevent getting sickened by or spreading the 2019-nCoV virus. Those steps include:

1. Spending at least 20 seconds washing their hands as often as possible using soap and water.
2. Make sure your hands are washed before touching the mouth, eyes or nose.
3. When people are sick with the virus, avoid close contact with them.
4. If you are sick with the virus, stay home.
5. Clean and disinfect object and surfaces that are touched frequently.
6. If traveling to China, avoid contact with dead or live animals, sick people, animal markets and animal products like uncooked meat.
7. Seek medical care immediately if you visited China and within two weeks you have a fever, are coughing or have difficulty breathing.
8. Before going to a medical facility, tell the staff you recently visited China.

A Very High Infection Rate

According to the results of an early study published in the international general medical journal *The Lancet* and several Chinese newspapers, early analysis of the people in China who come in contact with the 2019-nCoV virus show an infection rate of about 83%. This has some alarmed because of the potential consequences it can have for people around world. About 50% of people in China infected by the virus are from the Wuhan area. .

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SPIRITUAL HUMANISM: A CONTEMPORARY PERSPECTIVE OF ADVAITA VEDANTA

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An analysis of the contemporary socio-political thought reveals that the basic stream of these thoughts spring from the ancient Indian philosophy of Vedas. Contemporary Indian thinkers analyzed ancient Indian socio-political thought, accepted its philosophical bases, endorsed its world view and the concept of human nature, condemned social evils like casteism, communalism, regionalism, colonialism and economic exploitation and suggested remedies. They examined the problems of our country from a nationalist and patriotic point of view. They cherished the ideal of spiritual nationalism and thus almost all of them propounded the message of internationalism and humanism. All of them were conscious of the crisis being faced not only by Indian society and politics but also for the establishment of a universal brotherhood.

None of the modern Indian thinkers had in their search for modernity, cut themselves off from the mainsprings of Indian culture and tradition. Instead, they laid great emphasis to build their foundations of change on old Indian traditions. Contemporary Indian thought shows a deep appreciation of the problems of human life and the destiny of man, and in this sense all modern thinkers were humanists. Their humanistic ideas were inspired by the struggle against foreign domination, economic exploitation, and social evils like caste system, untouchability, sati, child marriage, etc. As stated by Sri. Asianand, 'Modern Indian renaissance represents not only the coverage of the nationalist mainstream of the pre-independence period but also reflects the total throb of the Indian spirit, the civilization's souls as personified by a large number of national leaders from Ram Mohan Roy and Sri Ramakrishna to Vinoba Bhave.'¹ Hence we can say that in contemporary Indian thought did not lose touch with the past but it was a synthesis of ancient Indian values and modern western science.

Even though it gives importance to spiritual values, it gives a due regard to empirical and this worldly existence also. Actually, the contemporary Indian thinkers try to reconcile the two. They believed that philosophy is essentially tied up with life and asserted that even after attaining salvation an individual has to work for the welfare of the world. All of them were humanists in one sense or the other. These great thinkers were proving through their life that at every stage in the life of an individual, there is a need to serve the world. So they held that there can be no feeling of separation from others and the welfare of so called other (fellow-beings) become the welfare of oneself. This paper is an attempt to highlight the fact that contemporary Indian thinkers who



based their philosophy on Vedānta tradition were inspired by spiritualism but had great concern for man and the social reality in which they lived. So they worked for the betterment of humanity. This is the message we get from the life and ideals of Modern Indian thinkers and this highlights Spiritual humanism as a dormant aspect of their philosophy.

Humanism in Modern Indian thought

The contemporary Indian thinkers believe that the roots of philosophical thinking lies in the considerations that are existential and assert that life means living in the midst of life situations and in spite of them. The initial focus on suffering by the contemporary Indian thinkers makes one aware of one's false identifications with the external objects of the world and inspires one to attain the goal of life, which is freedom from pain and misery. Hence we can say that they speak of the ultimate escape, more or less, in the same manner of ancient Indian thinkers. But they hold that while philosophy is concerned with the existent individual living in the midst of his living conditions, the ultimate ideal of philosophy is the redemption of both the individual and of the race. So they accepted the reality of world and also the bodily aspects of man. As stated by B.K. Lal "Unlike the ancient Indian thinker, who thinks that a complete control of the body, the senses and the mind is essential for spiritual growth, the contemporary Indian thinker recommends that these propensities are not to be killed but perfected. The world is considered as the only field for action and the body as 'the temple of the Divine.' It is by emphasizing the reality of these and by assigning to the body and the senses some role in the process of spiritual growth that the contemporary Indian thinkers consider themselves to be close to the empirical and the matter of fact attitude of the present times."² Here we can see that contemporary Indian thinkers are trying to associate philosophy with the actual and the practical problems of pain and suffering.

Unlike the ancient Indian thinkers, most of the contemporary Indian thinkers assert the dignity of humanness and give reality to the world. Philosophers like Dr. S. Radhakrishnan agree with Sankara and distinguish between the transcendent or *paramārthika* and the empirical or *vyvahārika* levels of existence. Thinkers like him believe that the ideal of life can be reached only by transcending the finite world. So they do not consider it as a misfortune to be in the world as a human being as in the case of ancient thinkers. Instead, they consider it as a must to reach the ideal of life and so they assert the dignity of human life. They believe that philosophy is essentially tied up with life. They asserted that even after attaining salvation, an individual has to work for the welfare of the world. He should live amongst his fellowmen helping the masses to get liberated by showing them the right path towards salvation. Contemporary Indian thinkers held that 'no man is saved unless the race is saved.'

As stated earlier, all of them were humanists in one sense or the other. The popular concept of humanism is that it is an outlook which elevates man above everything else and demonstrates his supremacy over the rest of the creations. It may be defined as an attempt to explore the ways and means to bring about common welfare and progress of mankind through an all-round enrichment of individual lives. The supreme concern for



man is at the center for every humanistic philosophy. As it is described by Dr. S. Radhakrishnan, "In recognizing the central importance of man in the scheme of things and emphasizing his freedom and individuality and creative power-his role in shaping and moulding his environment with view of making a better and happier world, humanism preached the gospel of activism, full of hope and promise for the future of mankind."³ Thus we see that humanism is an outlook that demonstrates the supremacy of man and recognizes the value or dignity of man and asserts the centrality of human being.

While analyzing the philosophy of most of the contemporary thinkers we find that they were all humanists in a particular sense of the term. For example when we go through the thoughts and ideas of Swami Vivekananda, we find that he tried to give to his philosophy a humanistic grab and strongly recommended humanitarian work and service. But he had an unflinching faith in the ultimacy of spiritual pursuits and ideals and so his philosophy may be considered as spiritual humanism. Thinkers like him have succeeded in obliterating the opposition between humanism and spiritualism by suggesting that the former envelops and comprehends the latter. So spiritualism no longer becomes incompatible with humanism, but becomes an aspect of it.

Even in the realm of religion and philosophic implications, contemporary Indian philosophers adopt a humanistic attitude and they held that religion is for man and not man for the religion. The best examples for this attitude can be seen in the concept of Universal Religion in the philosophies of Mahatma Gandhi, Rabindranath Tagore, Swami Vivekananda, Dr. SRadhakrishnan, and Sri. Aurobindo etc. The main reason for highlighting such a concept in their philosophies may be attributed to the fact that India being a multi-religious society, there was a great need for religious integration and harmony. Social service, compassion and feeling of oneness were the chief characteristics of this concept of universal religion and these ideals have a purpose, validity and relevance even today.

From the preceding analysis we have got a clear picture of the important characteristics shared by almost all contemporary Indian thinkers. The most important contemporary Indian philosophers are Raja Ram Mohan Roy, Sri Ramakrishna, Swami Vivekananda, Rabindranath Tagore, SriAurobindo, Mahatma Gandhi, Dr. K.C. Bhattacharya, Dr.S. Radhakrishnan etc. As it was stated by Sri. T.M.P. Mahadevan, "Although none of them are living today, all have left behind their indelible 'foot-prints on the sands of time,' which will continue to inspire generations to come. Their teachings represent a cross-section of living Indian thought and may serve as a guide to the nature and content of India's hoary religio-philosophic culture."⁴ Among these thinkers, here I am trying to analyze the philosophical aspects of Sri Ramakrishna, Sri Aurobindo, Mahatma Gandhi and Swami Vivekananda.

Spiritual Humanism as an Aspect of Modern Indian Thought

The supreme ideal which Sri Ramakrishna placed before humanity was that of God realization. It is necessary not only for ultimate freedom and ultimate bliss but also for



worldly peace, serenity and prosperity. When a man turn himself to this spiritual ideal and regulates his activities accordingly he raises himself physically mentally and morally. This will lead to peace and prosperity because the peace and progress of the world depend primarily on individual beings. Only better men and women can create a better world so the Ramakrishna gave importance to human factors and directed primary attention to the development of man's inner life. As stated by Swami Satprakashananda, "it was revealed to Sri Ramakrishna by his spiritual experiences that he had a Divine Mission to fulfil; that his practices and realizations were intended not for his personal benefit but for the good of humanity. He wanted to establish a new religious order for the regeneration of India, for the spiritual awakening of mankind, and for the establishment of harmony among the different religions of the world."⁵

The greatest contribution of Ramakrishna movement to the modern world is its message that all help given by men to individuals or society should be on the basis of man's divinity without regard to any differences. The potential divinity of man is the universal ground of human relationship as it transcends all differences between man and man. So Sri Ramakrishna held that the only way to bring about unity and love of mankind is to find this all embracing ground of human relationship which transcends all distinctions based on race, colour, creed, rank, nationality, merits etc. This alone lead to peace, progress and prosperity. Again he asked his disciples not to renounce the world but be karma yogins, i.e., they were to practice detachment in the midst of worldly concerns. The Gita ideal of self-less work combined with devotion to God was his message. We should not forget the fact that his life itself was an example of God intoxication, spotless purity and surging love for humanity. So we can say that Ramakrishna's message was a restatement of the Vedānta truths. He was a mystic and a great seer that the world has produced in the modern age who had direct experience of God in His absoluteness. His life enables us to see God face to face. Thus he brought about the renaissance of Hinduism which revived not only the Upanishadic truths but also extended the limits of Hinduism to universalism, dynamism and Catholicism.

Sri Aurobindo held that through Yoga mankind can resolve its crisis and it will usher the human race into in a new era. This is the realization of the Divine life up on earth. The spiritual fulfilment of the individual through yoga is its first condition. Its second condition is the individual's complete oneness with all life upon earth. So long as the individual is underdeveloped, he might follow the dictates of society, state or community, though ultimately his own protect whatever is greater than himself. But as he grows in spiritual freedom, he need not conform to the state or community, though ultimately his own perfection leads to the perfection of society.

Spiritual freedom is the sound foundation of the principles of democracy, liberty, equality and fraternity. That being given all problems will be solved and Aurobindo held that spirituality alone can lead to a perfect harmony in human society. Hence we can say that Sri Aurobindo envisages spiritual or idealistic humanism where we see that the human life, body and mind are the forms of the supermind and they become divinely transformed. It becomes life divine. Sri Aurobindo thus conceives the evolution of



divine humanity. This integral yoga aims at the transformation of the entire earth consciousness. It seeks cosmic liberation. The yogic method transforms the man as an individual as well as a social being. It has to be practiced not only for the attainment of divinity, but also for the welfare of mankind. Because, if each individual develops in this way, the human race will also develop gradually. Thus Aurobindo held that, by the practice of yoga, one secured base for the fundamental inner complete and real unification of humanity would be developed.

The practical teachings of Swami Vivekananda are predominantly humanistic and intensely activist and dynamic. This humanism which is found in the philosophy of Vivekananda may be called spiritual humanism. It is also idealistic humanism or humanistic Advaita. The implications of humanism are transparent in the whole philosophy of Swami Vivekananda. Humanism is a way of perceiving things by relating them to man, or it is a philosophy of man. It recommends strongly humanitarian work and service of humanity. His humanism is derived from the idea of *adhyātmavidyā* or the science of spiritual possibilities. All human development is based upon the discovery of these possibilities dormant within everyone. The spiritual humanism of Swami Vivekananda advocates identity of humanity with divinity. It is clear in his utterance that 'each soul is potentially divine and the aim is to realize this divinity.' It defends the purity of human nature, regards man as God, attacks social, economic and religious evils in the society and inculcates faith and strength in the individual. Vivekananda preached the doctrine of universal brotherhood establishing perfect peace and harmony in the world. He found that the cause of moral and spiritual degradation among the people of was due to the lack of faith in themselves. Thus to have faith in oneself is the first essential condition. "The great thing is to have faith in oneself, even before faith in God; but the difficulty seems to be that we are losing faith in ourselves day by day."⁶ Swami Vivekananda believed that the social change could only come from spirituality and the Neo-Vedānta which proclaimed the innate divinity in man will lead to the universal human welfare. Thus the implication of spiritualistic humanism is very clear in his philosophy of Neo-Vedānta. Serving humanity is the important feature of the humanism of Swami Vivekananda. Service of humanity is the best form of worship of God according to Swamiji. He has developed the idea of '*DaridraNārāyaṇa*' which means to see God in the poor, ignorant, weak and in the diseased. Help them and regenerate them as worshipping God. For Vivekananda, man is not only to be loved and served but also to be worshipped as God. In a liberated stage man and God are united.

In a spiritually humanistic society, there is no inconsistency between the ideal of divinity and humanity. It is based on the idea that "Man is the highest being that exists and this is the greatest world. We can have no concept of God higher than man so our God is man and man is God."⁷ Though the philosophy of Swami Vivekananda is highly spiritualistic or idealistic, he is not against the material development of the country. He believed that scientific and technological developments are essential for the regeneration of India. As a humanist, he is highly concerned about the poor people and the down trodden. They need special care and attention. He believed that there is no use of talking of about religion to starving man. In his own words, "I do not believe in a



God or religion which cannot wipe the widow's tears or bring a piece of bread to the orphan's mouth.”⁸

The practical outcome of spiritual humanism of Swami Vivekananda may be summed up in the ideal of social service, divinity in man, the ideal of Universal Religion and gospel of love. It brings us to the feeling of oneness of existence in the society. A peaceful and loving relationship between man and man can be established by this doctrine of spiritual humanism. Now it becomes clear that Swami Vivekananda has revitalized the Indian thought. He identifies his thought with the philosophy of Advaita Vedānta and gives it in a new form. His approach was synthetic and dynamic and humanism is the dominant note in the whole philosophy of Vivekananda. He laid supreme emphasis on service of humanity on a spiritually oriented self-dedication. He preached the doctrine of universal brotherhood establishing perfect peace and harmony in the world. There can be real regeneration of man in all walks of life if his teachings and preaching are studied and practiced.

The imperfections of the existing social order necessitated many philosophers to visualize an ideal social order, wherein man can realize all his potentialities, and lead a happy and peaceful life, where there is equal distribution of wealth and no discrimination on the basis of class, caste religion, social status etc. The leaders of our freedom movement had to face challenges of overcoming massive poverty and inequality perpetuated by the oppressive colonial politico-economic system and the reactionary social system simultaneously. The Gandhian answer to this challenge was the philosophy of Sarvodaya which is an effort to mitigate the sufferings of the humanity and the establishment of an ideal social-political and economic structure that would strive to achieve the welfare of all. Gandhi subscribed to the belief that all human beings belong to one single family. Exploitation or inequality in any form was a rejection of this principle. Hence, he wanted to establish a new society which was completely free from exploitation and oppression. Here we see that while Vivekananda preached Neo-Vedānta for the regeneration of the Indian community, Gandhi presented plans to make this ideal a reality through his philosophy of Sarvodaya. It is both an ideal vision and a praxis-action programme for the welfare of all. These two functions of Sarvodaya are complete and as an ideal it set goals and inspires people to engage in an action programme to achieve the goals. The ideal of Sarvodaya is the welfare of all and it represents a social order based on all embracing love. All are treated as equal members in this social order, all sharing in the produce of their labour, the strong protecting the weak and functioning as their trustees and protectors, each promoting the welfare of all, according to their abilities and through all the means at their disposal. Here no individual or group is suppressed or exploited. Therefore, Sarvodaya is the peaceful and non-violent way of achieving social justice.

Conclusion

From the preceding analysis and elaboration of the philosophies of contemporary Indian thought, we can clearly understand the fact that the basic stream of their



philosophy was spiritual humanism. Among the thinkers which we have brought to study here, we have seen that while Sri Ramakrishna and Sri Aurobindo followed an idealistic form of spiritual humanism, we can see a practical version of spiritual humanism in the philosophies of Swami Vivekananda and Mahatma Gandhi. It is clearly evident that all the contemporary Indian thinkers dealt here was following the traditions of Advaita in one way or another. They tried to expound Advaita in various ways and in this sense, they were all spiritualists. They were all concerned about the world in which they lived and not about their selfish interest. They held that Advaita has solutions for sustainable material progress as well as attaining spiritual goals. They aimed at overcoming selfishness and tried for individual perfection which will lead to social welfare. Here they are highlighting humanism in terms of the role of the individual in society where the interest of the individual completely merges in that of the society. They suggested self-denial and self-sacrifice as the abiding spirit for the cause of humanism because the seeds of humanism ought to be grown and developed through the concept of socialization. These great thinkers were proving through their life and thought that according to Advaita, at every stage in the life of an individual there is a need to serve the world. Their mission was to spread the message of oneness and transcendent unity of all religions and they had genuine feelings of love for their fellow beings. This formed the basis of spiritual humanism in the modern Indian thought and this philosophy will continue to inspire and enlighten the future generations also.

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TACKLING BANKRUPTCY DECISION-MAKING: THE IMPACT OF THE CODE ON THE BEHAVIOURAL PSYCHOLOGY OF STAKEHOLDERS

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Introduction

The human decision-making process is often not a linear, rational path, and is impacted by various factors such as cognitive biases, emotional and social influences¹ which affect the behaviour. In behavioural economics, powerful insights into the tendency of the people's decision-making process help the lawmakers design rules to overcome the hurdles to efficient functioning and achieve the goal of the legislation.

Pre-IBC, the matters of insolvency and bankruptcy in India were unabashedly in favour of the debtor, considered a “defaulter's paradise”² since the repayment of loans to the creditors was an option, not an obligation. This was not only detrimental to the creditors but also resulted in huge loss of economic revenues. The Code came into effect with the goal of reforming the debtor behaviour in India and gave the control where it was due—the creditors. It relied on a sophisticated behavioural psychology concept of nudging—which encourages positive choices rather than restriction of undesirable behaviour. This gives the individual the freedom of choice and also changes the course of action for the problem. The Code thus provides “nudges” which indirectly influence the “choice architecture” of individuals, both action and inaction then leads to funnelling towards more desirable outcomes.³

It has immensely contributed to a change in the behaviour of the stakeholders involved in an insolvency matter. A direct result was the rejuvenation of 221 businesses⁴, monetary recovery of INR 1.84 trillion for the creditors,⁵ and indirect (pre-admission settlement) recovery of around INR 4 trillion.⁶ In this article we will discuss how the Insolvency and Bankruptcy Code 2016 is shaped via behavioural psychology inputs and how it shapes the behaviour of the target audience, by seamlessly nudging the corporates towards good conduct.

Main Biases Present in Insolvency Behavioural Economics:

1. Failure Bias

One of the core biases an individual falls into is basically a lack of vision, they focus on the failures of other individuals concerning a process and ignore the successes of those who overcame that process. This bias usually leads to false conclusions, like a snowball

¹Korteling, Brouwer, Toet. *A Neural Network Framework for Cognitive Bias*, Frontiers in Psychology, Vol. 9, Sept 3, 2018.

²Judgement in the case of *Swiss Ribbons Pvt. Ltd. V. Union of India*. 2019 SCC OnLine SC 73

³When ‘nudging’ is forever—the case of Sweden. Dee Gill. Chicago Booth Review. Feb 20, 2018.

⁴The Quarterly Newsletter of Insolvency and Bankruptcy Board of India. Jan-March 2020, Vol.14.

⁵Ibid.

⁶IBC process helps creditors recover Rs 1.6 trn, revives 160 companies. Dec 20, 2019. Business Standard.



effect of biases which plague the individual. This is the opposite of Overconfidence Bias.

2. Loss Aversion Bias

Once, the failure bias is set into the psyche, the individual prefers maintaining a monetary status quo by preventing loss of present capital than gaining equivalent profits. This in turn paves the way for confirmation bias.

3. Confirmation Bias

This bias allows the individual to fixate on the information that supports and confirms their pre-existing ideas.⁷ In this bias, they effectively ignore any contradicting information which might serve a wiser purpose. This bias perpetuates the anchoring bias.

4. Anchoring Bias

The anchoring bias is where the individual relies too heavily on the first single piece of information they come across. This information serves as an ‘anchor’ when taking decisions. Anchoring Bias is what culminates into Overconfidence Bias.

5. The Overconfidence Bias

A success of an economy is measured by the amount of credit it can provide. In such an economy when the legal credit constraints are relaxed, there is a tendency among businesses/ corporates to accumulate unnecessary debt. The individual, if working inefficiently, tends to be a victim of such bias where they inaccurately gauge risk, inflate future costs and growth based on information readily accessed from their memories without fact-checking. Usually the debtor suffers from this bias, due to their “it cannot happen to me” bias⁸, thus facing unexpected insolvency processes.

These biases carry a significant effect in insolvency and bankruptcy proceedings. And while the IBC cannot prevent the debtor from falling into the overconfidence bias, it certainly manages the stakeholders’ behaviour by providing potential solutions to the cognitive problems by encouraging them to make better decisions.

Behavioural Changes Observed Via:

1. Nudging

The main focus of IBC is revival of financially distressed businesses, and prevention of liquidation of companies.⁹ It is inevitable to prevent overconfidence bias in the Corporate Debtor (CD) and thus to rejuvenate a sick company from terminal illness, the Code, as a priority, distances the business from the management and promoters from the onset of an insolvency process. This distancing prevents the previously common practice of unfair pecuniary benefits towards promoters instead of creditors. The

⁷ P. C. Wason. *On the failure to eliminate hypotheses in a conceptual task*, Quarterly Journal of Experimental Psychology, Volume 12, Issue 3, 1960. Published online: Apr 7, 2008.

⁸ J. J. Kilborn, *Behavioral Economics, Overindebtedness & Comparative Consumer Bankruptcy: Searching for Causes and Evaluating Solutions*, Emory Bankruptcy Development Journal, Vol. 22, 2005.

⁹ Swiss Ribbons Pvt. Ltd. V. Union of India. 2019 SCC OnLine SC 73



Insolvency Professional (IP) is placed in charge of the management and the Corporate Promoters and Personnel are required to assist the IP.¹⁰ Furthermore, the non-compliance by promoters and personnel is not tolerated by the judicial authorities.¹¹ This is procedure has manifold significance as it deters the management of the business from default towards its creditors and operating below optimum level of efficiency. Further, it encourages the debtor and creditor to reach out-of-Court settlement at the earliest. Thousands of such disputes have been settled out of Court with a recovery rate of INR 4 trillion in the past years,¹² including cases which were admitted and then withdrawn due to settlement, as of March 2020 stands at 157.¹³

Reasons for Withdrawal after Admission	No. of CIRPs
Full settlement with the Applicant	38
Full settlement with other Creditors	8
Agreement to settle in future	10
Other settlements with Creditors	45
Total	157

Table 1

This willingness in the debtor's behaviour to settle monetary claims with the creditors on time or before CIRP is commenced is only possible due to the built-in mechanism of the Code which at the outset, places stakeholders in a resolution-oriented insolvency process. Failure to reach resolution results in liquidation which is death of the company, and the CD is sure to prevent the consequences by working with the Creditors (FCs & OCs), either before loss of management control or before liquidation.

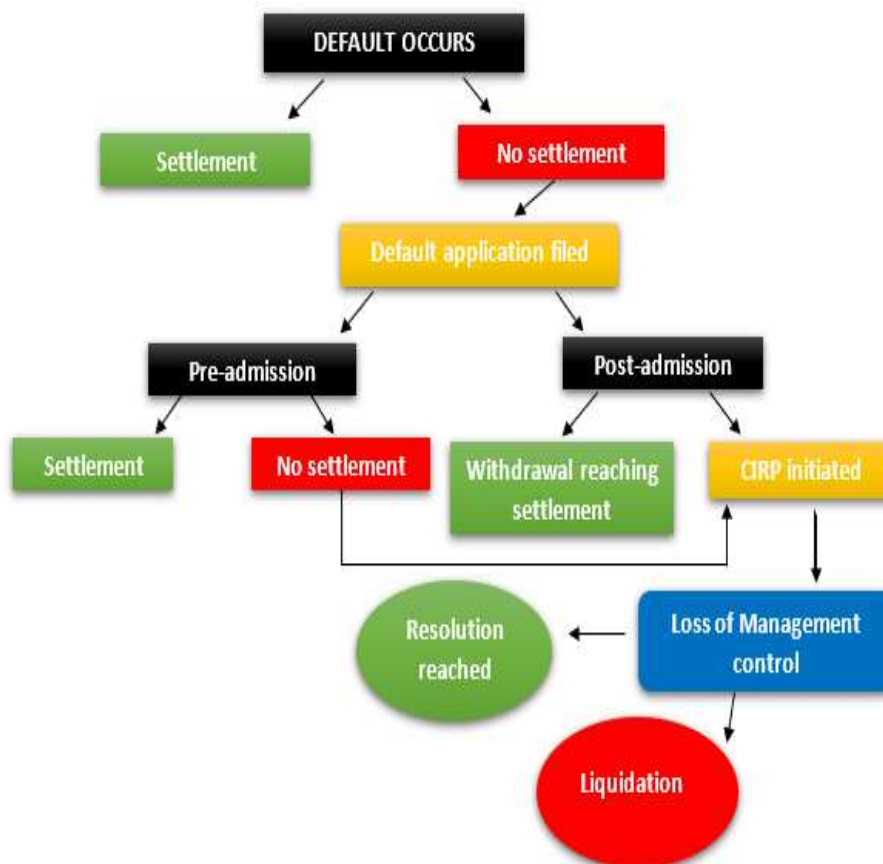
Flowchart 1 provides two-way solutions at each stage and makes it easy to choose for the stakeholders, especially the CD to leverage good behaviour or face the consequences of their own choices. This strategy leverages the loss aversion bias, where the stakeholders try to avoid losses more than making gains, and the Codes choice structure incentivises the good behaviour of the CD to remain operational than to lose their control. It also works on the anchoring bias of the stakeholders, by providing default choices in case of inaction (i.e. no settlement/ resolution) which work to maximise their own welfare and that of the society as a whole.

¹⁰Section 17 (1) (c) & Section 19 of the Insolvency and Bankruptcy Code 2016

¹¹Ajay kumar. Vs. Shree Sai Industries Pvt Ltd &Anr. Company Appeal (AT) (Insolvency) No. 616 of 2019

¹²IBC process helps creditors recover Rs 1.6 trn, revives 160 companies. Dec 20, 2019. Business Standard.

¹³The Quarterly Newsletter of Insolvency and Bankruptcy Board of India. Jan-March 2020, Vol.14.



Flowchart 1

The Committee of Creditors (CoC) plays an important role in the resolution process once the process commences when CD fails to reach a settlement. At this point, the IBC has substantiated the CoC, comprised of FCs and OCs with significant decision-making abilities. They are to protect the interest of all the stakeholders by evaluating the feasibility of the resolution plan. This conference of power into the hands of the CoC has nudged them to good behaviour by increased accountability and incentivised the Creditors to refrain from pre-resolution fiscal draining of the assets of the CD.

2. Transparency & Reinforcement

IBC tackles the perils of failure bias by actively disclosing the outcomes of the realised benefits of good behaviour of the stakeholders. The IBBI and RBI provide transparency in the success of the CIRP and deliver the detailed data of CIRPs which yielded in resolutions (refer to Table 2), including realised value of assets received by the Operational and Financial Creditors, which is 183% of the value they would have

received at liquidation.¹⁴ This encourages good behaviour in the stakeholders when initiating or going through the CIRP. The Adjudicating Authorities (AAs) also play a significant role in the evolution and understanding of the Code.

Time Period	Total Admitted Claims by FC (INR crores)	Liquidation Value (INR crores)	Realisable by FCs (INR crores)	% of their Admitted Claims	% of Liquidation Value
Jan-Mar '18	4405	1427	3070	69.70	215.11
Apr-Jun '18	76239.12	18084.36	42885.44	56.25	237.14
Jul-Sept '18	42269.56	9541.80	11079.32	26.21	116.11
Oct-Dec '18	8447.71	2953.97	6958.46	82.37	235.56
Jan-Mar '19	39675.20	6155.97	9568.5	24.11	155.43
Apr-Jun '19	32385.84	6836.19	7151.33	22.08	104.60
Jul-Sept '19	79442.25	14870.43	27159.17	34.18	182.63
Oct-Dec '19	25762.51	2853.32	3513.61	13.63	123.14
Jan-Mar '20	39101.77	19567.67	25063.79	64.10	128.09
Total	384436.67	96349.52	176673.70	45.96	183.37

Table 2*¹⁵

Source: IBBI

The lawmakers were aware that to influence perpetual good behaviour from the stakeholders would require assistance to the transparency of the data. The reinforcement has been in the form of constant updates to the IBC due to the collaboration between the Government and the IBBI with the market participants. The activeness of the legal framework has brought a sense of reliability to the stakeholders. It also harnesses the power of confirmation bias by creating a pattern of successful resolutions via transparency, so that the future stakeholders would readily take recourse to the IBC when necessary. The legislation also pays attention to the rising entrepreneurial spirit in the nation and the swift resolution mechanism allows for easy exit for MSMEs so they can start afresh.¹⁶

Conclusion

Behavioural psychology has shaped and strengthened the efficacy of the Insolvency and Bankruptcy Code, the deficiencies observed before the implementation of the Code in 2016 required a systemic response to the detrimental behavioural patterns observed in the stakeholders- CD, Promoter, FC, OC. Three fundamental behavioural principles of

¹⁴ Ibid.

¹⁵ *The data from October 2016 to December 2017 has not been listed in the table but the amounts have been added in the grand total.

¹⁶ *Faster insolvency process in place for startups, small companies. Economic Times. Jun 18, 2017.*



nudging, transparency and reinforcement contribute to the most mischievous biases present in the insolvency and bankruptcy market. Seeking recourse via the IBC is completely voluntary and presents a symphonic choice architecture to tackle negative behavioural aspects, allowing it to be considered amongst the most impactful economic legislations in India.

The IBC is responsible for the recovery of trillions of Indian Rupees since its inception in 2016 and it has been possible due to the subtle but strong response to the encourage good behaviour in the stakeholders. The emphasis on the resolution seeking process ensuring the interest of all parties involved, along with the maximisation of the asset value is set in motion via processes of default good choice if the stakeholders find themselves in a twist.

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वैदिकं शारीरिकं विज्ञानम्

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TIRUPATI

1. उपोद्घातः

लोकव्यवहारस्य प्रथमं साधनं शरीरम्। शरीरमाध्यमेनैव मानवः सर्वकार्याणि साधयति। शरीरमाद्यं खलु धर्मं साधनम्। यः शरीरविज्ञानं सम्यक् जानाति स एव तस्य उपयोगमपि सम्यग् कर्तुमर्हति। यथा आधुनिकैः शरीरस्य विविधांशाः सूक्ष्मतया परिशीलिताः तथैव वैदिकैरपि शरीरसंबद्धांशाः स्वदृष्ट्या परिशीलिताः। विविधविषयेषु आधुनिकानां वैदिकानाञ्च प्रतिपादने भिन्नता स्यात्। तथापि बहुषु विषयेषु साम्यमपि वर्तते। वैदिकपद्धतिमनुसृत्य प्रपञ्चे लक्षशः वर्षाणि मानवाः निरामयाः निरातङ्काः लोकहितकामुकाः भूत्वा सार्थकं जीवनमकुर्वन्। बहवः वैदिकांशाः इदानीमपि जीवनोपकारकाः। वैदिकशरीरविज्ञानं शारीरकस्वास्थ्यपरिरक्षणेन सह मानसिकस्वास्थ्यमपि परिरक्षति। एतेन मानवाः मानसिकस्वस्थाः अपि भवन्ति। इदं वैदिकं शरीरविज्ञानं लोकोपकारकं भवतीति धिया अस्मिन् अन्ताराष्ट्रिय वेदविज्ञानसम्मेलने वैदिकं शारीरिकं विज्ञानम् इति शीर्षकान्वितं पत्रं प्रस्तौमि।।

2. शरीरस्य उत्पत्तिकारणम्

ब्रह्मणा कालः शुभाशुभरूपेण द्विधा निर्मितः। सः पुनः भूत-वर्तमान-भविष्यत् भेदेन त्रिधा परिगण्यते। शुभकालः उत्सर्पिणी इति, अशुभकालः अवसर्पिणी इति च कथ्यते। उत्सर्पिणीकालः आदियुग- देवयुग-कृतयुगत्वेन त्रिधा भवति। एवं त्रेता- द्वापर- कलियुगः अवसर्पिणी (अशुभः) काले अन्तर्भवति। युगमनुसृत्य तत्तत्कालसंबद्धं भोगायतनं शरीरमुत्पद्यते। काश्यपसंहितायामस्मिन्विषये विस्तृतविवरणं लभ्यते।

यथा-

कृतयुगे तु नारायणं नाम देहिनां संहननं शरीरमुत्पद्यते। तस्मात्तदाहुः- तस्य घनं निष्कपालं शिरः, अस्थीनि च सत्त्वास्पदान्याकृतयो वज्रगरीयस्यः, हृदि चास्य महासिरा दशैव, त्वगस्य शिरश्चाभेद्यमच्छेद्यं, सर्वतोऽस्य शुकं, योजनं चास्योत्सेध, सप्तरात्रं चास्य गर्भवासः, सद्योजातस्य चास्य सर्वकर्माणि शक्यानि भवन्ति, न चैनं क्षुत्पिपासाश्रमग्लानिशोकभयैर्ष्याऽधर्मचिन्ताधिव्याधिजरा बाधन्ते, न स्तन्यवृत्तिर्भवति, धर्मतपोज्ञानविज्ञानस्थितियुक्तिश्चाति भवति। तस्य पलितोपमार्धमायुरुत्कृष्टमाहुरिति।

अथ त्रेतायामर्धनारायणं नाम देहिनां संहननं शरीरमुत्पद्यते। तस्यैकास्थिप्रायं शरीरमाकुञ्चन एवं प्रसारणवज्ज्यं, गर्भवासोऽस्याष्टमासिकः (8), स्तन्यजीविका च, द्वे शिरस्कपाले (2), पार्श्वयोरेकैकः सन्धिः उरसि च, त्र्यस्थि पृष्ठं (3), कोष्ठस्थ सिरा विंशतिः (20), शुकं च, पलितोपमं चतुर्भागमायुरुत्कृष्टं पूर्वाच्चार्धगुणावसर्पणमिति।।

अथ द्वापरे कैशिकसंहननं शरीरमुत्पद्यते केशमात्राणुसुषिरास्थि, अतिक्षिप्तसन्धिः, महाहस्तिबलः, सिरानुवेष्टितगात्रः, गात्रसन्धिषु चास्य शुक्रं, पलितोपमाष्टभागमायुरुत्कृष्टं पूर्वाच्चार्धगुणापसर्पणमिति।

अथ कलियुगे प्रजसिपिशितं संहननं शरीरमुत्पद्यते। तस्य षष्टिश्च त्रीणि चास्थिशतानि (360), भृशसुषिराणि मज्जपूर्णानि नलवदासन्नवधानि, चत्वारि मांसपेशीशतानि (400), सप्तसिराशतानि हृदयमूलानि (700), नव स्नायुशतानि मस्तुलुङ्गमूलानि (900), द्वे धमनीशते तालुमूले (200), सप्तोत्तरं मर्मशतं (107), त्रीणि महामर्माणि (3), दश प्राणायतनानि (10), पञ्चहृदयानि (5), त्रीणि सन्धिशतान्येकाशीत्यधिका (381), चतुर्दश कण्डराः (14), कूर्चा द्विचत्वारिंशत् (42), षट् त्वचः(6), सप्तधातवः (7), स्रोतांसि द्विविधानि (2), जातस्य पृथग्दन्तजन्म, दशमासं गर्भवासः (10), संवत्सरादूर्ध्वं प्रतितिष्ठति, वाचं च विसृजति, तस्य वर्षशतमायुरुत्कृष्टं (100), सुखदुःखाधिव्याधिजराभृत्युपरिगतः, सर्वगात्रः, क्षुत्पिपासागौरवश्रमशैथिल्यचितेर्ष्यारोषानृत-लौल्यपरिक्लेशमोहवियोगप्रायः, संसारगोचरः, आबाधबहुल इति द्वे द्वे युगे सत्त्वरजस्तमोन्वये विद्धि। इति पुरुषस्य सृष्टिकारणमुक्तम्।।काश्यपसंहिता अध्याय. 4

पूर्वोक्त विवरणं दृष्ट्वा कृतयुगादिषु एतादृशं शरीरं स्यात् वा इति संशयः उत्पद्येत । केचन एतत्सर्वमपि काल्पनिकमिति निराकुर्युः अपि। किन्तु कलियुगे मानवानां शरीररचनाविधानमस्मच्छरीरनिर्माणविधानेन संगच्छति। एतदाधारेण पूर्वोक्तविचारा अपि सत्यमेवेति मन्तव्यम्। आधुनिककाले इदानीं विद्यमानानां शरीराणां संरचनाक्रमस्याध्ययनमेव प्रचलति न तु पूर्वकालेषु विद्यमानानां शरीराणाम्। इदानीं शरीरस्य बाह्यसंरचनाविषये विचार्यते किन्तु अन्तःसंरचनाविषये विचार्यते चेत् काश्यपसंहितायां प्रतिपादितं विषयं अवश्यं साम्यं स्यात्। अतः पूर्वयुगानां शरीरसंरचना विषये इदानीन्तनविज्ञानं प्रमाणं भवितुं नार्हति। अस्मिन् विषये विशेषसंशोधनं कर्तुमवकाशः विद्यते।।

3. शरीरस्य विश्वस्य च सम्बन्धः-

यथा ब्रह्माण्डः तथा पिण्डाण्डः इति प्रसिद्धा उक्तिर्वर्तते। अस्यायं भावः यद्यथा ब्रह्माण्डस्य रचना तथा शरीरस्यापि रचना वर्तते इति। यदि शरीरतत्त्वं ज्ञातं भवति तर्हि ब्रह्माण्डतत्त्वमपि अवगतं भवति। अनन्तस्य विश्वस्य ज्ञानं सुकरं न स्यात् । किन्तु परिमितस्य शरीरस्य ज्ञानं दुष्करं न भवेत्। अतः शरीरनिर्माणज्ञानेन अस्माकं जीवनं समुन्नतं कर्तुं पारयामः। तथैव विश्वस्य रहस्यमपि ज्ञातुं शक्नुमः। एवं विचिन्त्य वैदिकाः ऋषयः शरीरविज्ञानस्य विवरणमकुर्वन्। वयं बाह्यप्रपञ्चे भूमि- सूर्य-चन्द्र- वायु- समुद्रादिविषयान् जानीमः। तेषामंशाः अस्मच्छरीरेपि विद्यन्ते। अयं विषयः अथर्ववेदे एवम् उक्तः-

यस्मिन् भूमिरन्तरिक्षं द्यौर्यस्मिन्नध्याहिता।

यत्राग्निश्चन्द्रमाः सूर्यो वातस्तिष्ठन्त्यार्पिताः।

12

स्कम्भं तं ब्रूहि कतमः स्वदेव सः॥ अथर्व. 10. 7.

यस्य त्रयस्त्रिंशद् देवा अङ्गे सर्वे समाहिताः।

स्कम्भं तं ब्रूहि कतमः स्वदेव सः॥ अथर्व. 10. 7. 13

प्रपञ्चे दृश्यमानविषयाणां शरीरगतविषयाणाञ्च साम्यमथर्ववेदे एवं प्रदर्शितम्-

यथा-

समुद्रो यस्य नाड्यः पुरुषेऽधि समाहिताः॥ अथर्व. 10. 7. 15

समुद्रः एवं नद्यः पुरुषस्य शरीरे नाडीरूपेण विद्यन्ते। बहिर्विश्वे नद्यः भवन्ति, पुरुषशरीरे त एव नाडीरूपेण भवन्ति। बहिः समुद्रः भवन्ति पुरुषशरीरस्य हृदये रुधिराशयः भवति। एतदेव ब्रह्माण्ड एव पिण्डशरीरे अंशरूपेण विद्यते। अत एव कथ्यते-

ये पुरुषे ब्रह्म विदुः ते विदुः परमेष्ठिनम्॥ अथर्व. 10. 7. 17

ये मानवशरीरे ब्रह्म पश्यन्ति ते परमेष्ठिं अवश्यं जानन्ति।

4. शरीरस्य त्रयस्त्रिंशद्देवतानाञ्च सम्बन्धः-

प्रपञ्चे विद्यमानतत्त्वानि वेदेषु देवतारूपेण उपासनासौकर्यार्थं प्रतिपादितानि। वेदे त्रयस्त्रिंशद्देवताः उक्ताः। वेदे एतेषां उल्लेखः बहुत्र दृश्यते-

यथा-

ये देवासो दिव्येकादश स्थ, पृथिव्यामेकादश स्थ,

अप्सु क्षितौ महिनैकादश स्थ ते देवासो यज्ञमिमं जुषध्वम्॥ वा. यजु. 7. 19,

आ नासत्या त्रिभिः एकादशैः इह देवेभिर्यातं मधुपेयमाग्निना॥

वा. यजु. 34. 47

श्रुष्टीवानो हि दाशुषे देवा अग्ने विचेतसः।

तान् रोहिदश्च गिर्वणस्त्रयस्त्रिंशतं आ वह॥ ऋ. 1. 45. 2

एता देवताः मनुष्य शरीरे कथं प्राविशन् इति उपनिषदि एवं वर्णनं विद्यते-

अग्निर्वाग्भूत्वा मुखं प्राविशत्, वायुः प्राणो भूत्वा नासिके प्राविशत्, आदित्यश्चक्षुर्भूत्वाऽक्षिणी प्राविशत्, दिशः श्रोत्रं भूत्वा कर्णे प्राविशन्, ओषधिवनस्पतयो लोमानि भूत्वा त्वचं प्राविशन्, चन्द्रमा मनो भूत्वा हृदयं प्राविशन्, मृत्युरपानो भूत्वा नाभिं प्राविशत्, आपो रेतो भूत्वा शिश्नं प्राविशन्॥ ऐ. उप. 1. 2. 4

एवं प्रकारेण देवताः शरीरे निवसन्ति। वेदेषु ब्रह्माण्डः भूलोकः, अन्तरिक्षः, द्युलोकः इति भागत्रये विभक्तः।

यजुर्वेदरीत्या देवाः पृथिव्यां एकादशः, अन्तरिक्षे एकादशः, द्युलोके एकादश तिष्ठन्ति। एवं भूम्यन्तरिक्षद्युस्थानेषु मिलित्वा 33 संख्याकाः वसन्ति। एवं मानवशरीरमपि

भूम्यन्तरिक्षयुस्थानत्वेन त्रिधा विभक्तः। नाभेरधः भूः, नाभेरुपरि कण्ठपर्यन्तमन्तरिक्षः, ततः ऊर्ध्वं (शिरः) युस्थानम्। एतेषु त्रिषु स्थानेषु 33 देवताः निवसन्ति।
शरीरे देवताप्रवेशविषये अथर्ववेदे काचन आख्यायिका श्रूयते -

दश साकं अजायन्त देवा देवेभ्यः पुरा।
यो वै तान् विधात् प्रत्यक्षं स वा अद्य महद् वदेत्॥ अथर्व. 11.8.3

पूर्वं दशदेवाः दशपुत्रान् अजनयन्। एते पुत्ररूपाः देवाः अस्य शरीरे आगत्य प्राविशन्।
अयं विषयः प्रकारान्तरेणापि उक्तः ।
यथा-

प्राणापानौ चक्षुः श्रोत्रं अक्षितिः च क्षितिः च या।
व्यानोदानौ वाङ् मनः ते वा आकृतिं आवहन्॥ अथर्व. 11.8.4 ॥

प्राण-अपान-चक्षु-श्रोत्र- अविनाश-विनाश-व्यान-उदान-वाणी-मनः एते दशसंकल्पाः
शरीरं प्राविशन्।

5. शारीरकगुणाः

अथर्ववेदे त्रयस्त्रिंशद् शारीरकशुभगुणाः उक्ताः। यथा-

ओजश्च तेजश्च सहश्च बलं च वाक्च इन्द्रियं च श्रीश्च धर्मश्च ब्रह्म च क्षेत्रं च राष्ट्रं च विशश्च
त्विषिश्च यशश्च वर्चश्च द्रविणं च आयुश्च रूपं च नाम च कीर्तिश्च प्राणश्च अपानश्च चक्षुश्च श्रोत्रं
च पयश्च रसश्च अन्नं च अन्नाद्यं च ऋतं च सत्यं च इष्टं च पूर्तं च प्रजा च पशवश्च॥
अथर्व. 12.5, 7-10

एतेषां गुणानामर्थविवरणं यथा-

- | | | |
|-------------------------------------|-------------------------|----------------------|
| 1. ओजः (सामर्थ्यः) | 2. तेजः (तेजस्विता) | 3. सहः (|
| शत्रुपराजयसामर्थ्यः) | 4. बलम् | |
| 5. वाक् (वक्तृत्वम्) | 6. इन्द्रियम् | 7. श्रीः (सम्पत्तिः) |
| 8. धर्मः (कर्तव्यः) | | |
| 9. ब्रह्म (ज्ञानम्) | 10. क्षेत्रम् (शौर्यम्) | |
| 11. राष्ट्रम् (राज्यं, राज्यशासनम्) | | |
| 12. विशः (प्रजाः) | 13. त्विषिः (कान्तिः) | 14. यशः |
| 15. वर्चः (प्रकाशः) | | |
| 16. द्रविणम् (धनम्) | 17. आयुः | 18. रूपम् (स्वरूपम्) |
| 19. नाम | | |
| 20. कीर्तिः | 21. प्राणः (श्वासः) | 22. अपानः |



23. चक्षुः(नेत्रः)
24. श्रोत्रम् 25. पयः 26. रसः(पेयः)
27. अन्नं, अन्नाद्यम्
28. ऋतम् (सरलता) 29. सत्यम् 30. इष्टम् (सुस्थितिः)
31. पूर्तं (पूर्तता)
32. प्रजाः(प्रजाजनः) 33. पशवः ॥

एते मनुष्याणामुन्नत्यर्थमुपकुर्वन्ति। एतेषां वर्गीकरणं शरीरगतस्थानमाधारीकृत्य एवं क्रियते-

5.1. द्युस्थानीयगुणाः

- (1) ब्रह्म (2) ऋतम् (3) सत्यम् (4) धर्मः,
(5) त्विषिः, (6) श्रीः
(7) वर्चः (8) वाक् (9) चक्षुः (10) श्रोत्रम्
(11) इन्द्रियम्

5.2. अन्तरिक्षस्थानीयगुणाः

- (1) प्राणः (2) अपानः (3) आयुः (4) सहः
(5) तेजः (6) क्षत्रम्
(7) राष्ट्रम् (8) विशः (9) द्रविणम् (10) इष्टम्
(11) पूर्तम्

5.3. भूस्थानीयगुणाः

- (1) पशवः (2) पयः (3) रसः (4) अन्नं, अन्नाद्यम्
(5) ओजः
(6) बलम् (7) रूपम् (8) नामः (9) यशः
(10) कीर्तिः (11) प्रजाः

उक्तञ्च-

गृहं कृत्वा मर्त्यं देवाः पुरुषं आविशन्॥

अथर्व. 11. 8. 18

देवाः मर्त्यं शरीरं गृहं कृत्वा प्राविशन्। यावद्देहे देवानामवस्थानं भवति तावत्कालं मानवः जीवति।

6. शरीरे विद्यमानगुणाः तेषान्नामानि च

यत्किमपि वस्तु केनचित् कारणेनैव निर्मितं भवति। तस्य किमपि प्रयोजनमवश्यमेव भवेत्। तद्वत् गुणधर्माणामवगमनेनैव तस्य स्वरूपं ज्ञातुं शक्नुमः। तथैव शरीरस्य कर्ता कः ? शरीरस्य

किम्प्रयोजनम् ? शरीरस्य धारणं पोषणं वा कथं भवेत् ? अस्य गुणधर्माः के इति अवश्यमेव चिन्तनीयम्। शरीरावगमनप्रक्रियायां वेदे शरीरस्थगुणाः विस्तृततया प्रपञ्चिताः। यथा-

स्वप्नो वै तन्द्रीः निर्ऋतिः पाप्मानो नाम देवताः।

जरा खालित्यं पालित्यं शरीरं अनु प्राविशन् ॥ 19 ॥

स्तेयं दुष्कृतं वृजिनं सत्यं यज्ञो यशो बृहत्।

बलं च क्षत्रमोजश्च शरीरमनु प्राविशन् ॥ 20॥

भूतिश्च वा अभूतिश्च रातयोऽरातयश्च याः।

क्षुधश्च सर्वा तृष्णाश्च शरीरमनु प्राविशन् ॥ 21 ॥

निन्दाश्च वा अनिन्दाश्च यच्च हन्तेति नेति च।

शरीरं श्रद्धा दक्षिणाऽश्रद्धा चानु प्राविशन् ॥ 22॥

विद्याश्च वा अविद्याश्च यच्चान्यदुपदेश्यम्।

शरीरं ब्रह्म प्राविशद्वचः सामाथो यजुः ॥ 23॥

आनंदा मोदाः प्रमोदोऽभीमोदमुदश्च ये।

हंसो नरिष्टा नृत्तानि शरीरमनु प्राविशन् ॥ 24॥

आलापाश्च प्रलापाश्चाऽभीलापलपश्च ये।

शरीरं सर्वं प्राविशन्नायुजः प्रयुजो युजः ॥ 25॥

प्राणापानौ चक्षुः श्रोत्रमक्षितिश्च क्षितिश्च या ।

व्यानोदानौ वाङ्मनः शरीरेण त ईयन्ते ॥ 26॥

आशिषश्च प्रशिषश्च संशिषो विशिषश्च याः।

चित्तानि सर्वे संकल्पाः शरीरमनु प्राविशन् ॥ 27॥

आस्तेयीश्च वास्तेयीश्च त्वरणाः कृपणाश्च याः।

गुह्याः शुक्रा स्थूला अपस्ता वीभत्सावसादयन् ॥ 28॥ अथर्व

11. 8. 19-28

शरीरस्थगुणाः शुभाशुभरूपेण द्विधा विभक्ताः। ते यथा-

6. 1. दुर्गुणाः-

1. निर्ऋतिः (निकृष्टस्थितिः) 2. पाप्मानो देवता (पापकार्यप्रवृत्त्यर्थं प्रेरकशक्तिः)

3. जरा (बृद्धत्वम्) 4. खालित्यम् (केशपतनम्)

5. पालित्यम् (केशश्रेतं भवति)

6. स्तेयम् (चौर्यम्) 7. दुष्कृतम् (दुष्कर्मप्रवृत्तिः)

8. वृजिनम् (पापः)

9. अभूतिः (अवनतिः) 10. अरातयः (दानं न दीयते, कृपणः)

11. क्षुधा (बुभुक्षा)

12. सर्वाः तृष्णाः (सर्वप्रकारकं तृष्णाः), 13. निन्दा

14. नेति (नास्ति इति कथयति)
15. अश्रद्धा 16. प्रलापाः (व्यर्थवार्ता) 17. अभीलापलपः -व्यर्थक्रियाकलापः
18. कृपणाः (कृपणता) इत्यादि शरीरस्थ दुर्गुणाः भवन्ति।।

6. 2. शुभगुणाः-

1. सत्यम् 2. यज्ञः 3. दक्षिणा (दक्षता)
4. विद्या (आत्मज्ञानः)
5. अविद्या (विज्ञानम्) 6. अन्यदुपदेश्यम् 7. ब्रह्म (ज्ञानम्)
8. ऋचः
9. साम 10. यजुः 11. आयुजः (आयोगः),
12. प्रयजुः (प्रयोगः), 13. युजः (योगः)
14. बलम् 15. क्षत्रम् 16. ओजः
17. प्राणः, 18. अपानः 19. व्यानः
20. उदानः 21. चक्षुः 22. श्रोत्रम् 23. वाक्
24. मनः 25. चित्तम् 26. संकल्पः 27. हंसः (हास्यः)
28. नरिष्टः (क्रीडा, यज्ञः) 29. नृतः (नृत्यः)
30. आलापः (गायनम्) 31. आशिषः 32. प्रशिषः
33. संशिषः 34. विशिषः (आशीर्वचनम्)
35. आनन्दाः 36. मोदाः 37. प्रमुदाः
38. अभिमोदमुदः (आनन्दस्यभोगः)
39. भूतिः (उन्नतिः) 40. रातिः (रातयः) 41. दानम्
41. क्षिति (निवासस्थानम्) 42. अक्षिति (अविनाशीस्थितिः), 43. अनिन्दा
44. हन्त (आनन्दस्य शब्दः) 45. त्वरणाः (त्वरः)
46. गुह्याः (गुप्तसङ्केतः) 47. शुक्राः (शुद्धः तथा बलवान्)
48. स्थूलाः 49. अपः (जलम्)
60. आस्तेयी 61. वास्तेयी (वसतियोग्यस्थानम्)
62. बृहत् यशः 63. स्वप्नः (गाढनिद्राः)
64. तन्द्री (एकाग्रता)। एते शरीरस्थ शुभगुणाः भवन्ति।।

महाभूतानि खं वायुरग्निरापः क्षितिस्तथा ।
शब्दं स्पर्शं रूपञ्च रसो गन्धश्च तद्गुणाः।।
खरद्रवचलोष्णत्वं भूजलानीलतेजसाम्।
आकाशस्य प्रतीघातो दृष्टं लिङ्गं यथाक्रमम्।।
लक्षणं सर्वमेवैतत् स्पर्शनेन्द्रियगोचराः।।

एते गुणाः शरीरे प्रविश्य निवसन्ति। त एव मानव व्यवहारे प्रतिक्षणं परिदृश्यन्ते॥ दुर्गुणाः शुभगुणाः शरीरे तिष्ठन्ति। एतेषां मिश्रणेन मनुष्यः उत्तमः, मध्यमः अथवा अधमः भवति।

7. वीर्यं शरीरस्य सारतत्त्वम्

देवानां निवासार्थं शरीरं निर्मितं स्यात्। एतच्च शरीरं शरीरादेव उत्पद्यते। शरीरोत्पत्तिविधानं वेदे यज्ञरूपेण प्रतिपादितम्। पुरुषशरीरात् कथं शरीरान्तरं उत्पद्यते इति कथनक्रमे वीर्यस्य महत्त्वमभिवर्णितम्।

वीर्यं शरीरस्य अङ्ग- प्रत्यङ्गानां सारसर्वस्वम्। अस्मिन् विषये वेदमन्त्रः एवं वदति-

अङ्गादङ्गात् संस्रवसि हृदयादधि जायसे ।

प्राणन्ते प्राणेन सन्दधामि जीव मे यावदायुषम्॥ छा. ब्रा. 1. 5. 16

अङ्गादङ्गात् सम्भवसि हृदयादधि जायसे।

वेदो वै पुत्रनामासि स जीवः शरदः शतम्॥ छा. ब्रा. 1. 5. 17

अस्मिन्मन्त्रे प्रतिपादितमस्ति यच्छरीरस्य अङ्गप्रत्यङ्गैः शिशोः अङ्गप्रत्यङ्गाः सम्भवन्ति। मनुष्यस्य शरीरं पञ्चमहाभूतैः विनिर्मितम्। इदं शरीरं विश्वस्य सारभूतम्। अस्य शरीरस्य सारभूतौऽशः वीर्यबिन्दुः। अत एव वीर्यस्य एक बिन्दुः विश्वस्य साररूपांशः। वृक्षात् बीजं सम्भवति एवं बीजात् वृक्षः सम्भवति। वृक्षे यत् विस्तृतरूपं प्राप्नोति तदेव बीजे सङ्कुचितरूपेण तिष्ठति। एवमेव वीर्यं सम्पूर्णं शरीरं सङ्कुचितरूपेण विद्यते, तदेव पुरुषरूपे विस्तृतिं प्राप्नोति।

8. शरीरस्यायुः प्रमाणम्

मनुष्यस्य जीवनं एकः यज्ञः। मनुष्यस्य आयुः प्रमाणे प्रथमचतुर्विंशति(24) वर्षाणि जीवनयज्ञस्य प्रातःसवनम्। चतुर्विंत्यक्षरा गायत्री। प्रातःसवने गायत्रीछन्दः भवति। अनेनैव वसुदेवताः सम्बद्धाः भवन्ति। प्राणाग्नयः एव वसुदेवताः। किमर्थं चेत्प्राणा एव अस्य शरीरस्य शक्तेः मूलस्रोतांसि। अस्य मनुष्यस्य प्रथमभागे यदि कापि व्याधिः जायते तदा सः एवं कथ्येत हे वसुप्राण ! इदानीं मम प्रातःसवनं माध्यन्दिनसवनेन साकं संयुक्तं भवतु। मध्ये अस्य प्राणाः विलुप्ताः मा भवन्त्विति। एवमुक्ते सति मानवः नीरोगः भविष्यति।
के एते वसवः इति प्रश्ने ? शतपथब्राह्मणं एवं वदति-

कतमे वसव इति। अग्निश्च पृथिवी च वायुश्च अन्तरिक्षं च आदित्यश्च द्यौश्च चन्द्रमा च नक्षत्राणि च एते वसव एतेषु हीदं सर्वं वसुहितं एते हीदं सर्वं वासयन्ते, तस्माद्वसव इति॥
शतपथब्राह्मणम्. 14. 6

एतेषामाधारेण सर्वं विश्वं सम्यग् प्रचलति। एते अष्टवसवः मानवस्य प्रथमचतुर्विंशति (24) वर्षाणामायुष्येण सम्बद्धाः सन्ति। एते प्रथमायुष्यस्य सुरक्षां कुर्वन्ति।

अथ यानि चतुश्चत्वारिंशद्वर्षाणि, तन्माध्यन्दिनं सवनं चतुश्चत्वारिंशदक्षरा त्रिष्टुप्, त्रैष्टुभं माध्यन्दिनं सवनं, तदस्य रुद्रा अन्वायताः, प्राणावाव रुद्रा, एते हीदं सर्वं रोदयन्ति। 3।।

तं चेदेतस्मिन् वयसि किंचिदुपतपेत्, स ब्रूयात्, प्राणा रुद्राः, इदं मे माध्यन्दिनं सवनं तृतीयसवनमनुसंतनुतेति, मा हं प्राणानां रुद्राणां मध्ये यज्ञो विलोप्सीय इति, उद्धैव तत एत्यगदो ह भवति॥ 4।। छान्दोग्य उ. 5. 16. 3-4

ततः परं मानुष्यम् आयुः प्रमाणं यच्चतुश्चत्वारिंशत्तुल्यं(44) भवति तद्यज्ञस्य माध्यन्दिनसवनं भवति। चतुश्चत्वारिंशदक्षराणि त्रिष्टुप् छन्दसि भवन्ति। त्रिष्टुप् छन्दसः प्रयोगः माध्यन्दिनसवने भवति। रुद्रदेवताः अस्य संबद्धाः भवन्ति। रुद्रः एव प्राणः। यः सर्वान् रोगरूपान् शत्रून् रोदयति। यदि पुरुषे चतुश्चत्वारिंशत्तुल्यं आयुषि कापि व्याधिः जायते तदा एवं वदेत् । हे रुद्ररूपप्राण ! मम यः माध्यन्दिनस्य कालविभागः तृतीयसवनेन सहैव भवतु। मम प्राणः मध्यभागे मा लुप्यतु। एवमेव प्रार्थिते सति मनुष्यः रोगमुक्तः सन् नीरोगः भवति। एवं 25 तः 68 वर्षपर्यन्तं जीवति। अर्थात् चतुश्चत्वारिंशद्वर्षात्मकः द्वितीयभागः आनन्देन यापितो भवति। अत्र रुद्रदेवाः के इत्युक्ते ! शतपथब्राह्मणं एवं कथयति-

कतमे रुद्रा इति। दश इमे पुरुषे प्राणाः आत्मा एकादशः।

ते यदा अस्मान्मर्त्याच्छरीरादुत्क्रामन्ति, अथ रोदयन्ति, तस्मात् रुद्रा इति॥ शतपथ ब्रा. 14. 6. 5

मानवशरीरे दशप्राणाः एवमात्मा च भवति । ते यदा शरीरं विहाय गच्छन्ति तदा सर्वान् रोदयन्ति, अत एव एते रुद्राः उच्यन्ते। प्राण-अपान-व्यान-उदान- समाना एते पञ्चप्राणाः।

एतेषां स्थानमेवम्-

हृदि प्राणो गुदेऽपानः समानो नाभिसंस्थितः।

उदानः कण्ठदेशस्थो व्यानः सर्वशरीरगः (अमरकोषः)।

हृदयस्थाने प्राणः तिष्ठति, नाभेरधस्तात् गुदद्वारे अपानः, समानं नाभिस्थाने विद्यते, उदानं कण्ठदेशे तिष्ठति, एवं व्यानं सर्वस्मिन् शरीरे विद्यते। एवं प्रकारेण पञ्चप्राणाः शरीरे स्थित्वा शरीरस्थदोषान् रोगबीजान् परिहरन्ति, शरीरं स्वास्थ्ये स्थापयन्ति। एतेषां सहैव पञ्च उपप्राणाः भवन्ति। तत्तु एवम्-

सप्तप्राणाः सप्तापानाः सप्तव्यानाः।



योऽस्य प्रथमः प्राण ऊर्ध्वो नामायं सो अग्निः।
योऽस्य द्वितीयः प्राणः प्रौढो नामासौ स आदित्यः।
योऽस्य तृतीयः प्राणोऽभ्यूढो नामासौ स चन्द्रमाः।
योऽस्य चतुर्थः प्राणो विभूर्नामायं स पवमानः।
योऽस्य पञ्चमः प्राणो योनिर्नाम ता इमा आपः।
योऽस्य षष्ठः प्राणः प्रियो नाम त इमे पशवः।
योऽस्य सप्तमः प्राणोऽपरिमितो नाम ते इमाः प्रजाः॥

अथर्व. 15. 15. 1-9

एतेषां नामानि ऊर्ध्वं, प्रौढः, अभ्यूढः, विभूः, योनिः, प्रियः एवमपरिमित इति। एते क्रमशः अग्निः, आदित्यः, चन्द्रमाः, पवमानः, आपः, पशुः एवं प्रजाः इति भवन्ति। एषः रुद्रप्राणः आयुषि पञ्चविंशति तः 68 वर्षपर्यन्तं भवति। मानवः एतेषां प्राणानां सम्यग्रूपेण प्राणायामादीनामनुष्ठानेन बलिष्ठः भवति। तेन नीरोगः सन् सानन्देन जीवति।

अथ यान्यष्टाचत्वारिंशद्वर्षाणि, तत् तृतीयसवनं अष्टाचत्वारिंशदक्षरा जगती, जागतं तृतीयसवनं तदस्यादित्या अन्वायताः, प्राणावाव आदित्याः, एते हीदं सर्वं आददते॥ 5॥

तं चेदेतस्मिन् वयसि किञ्चिदुपतपेत्, स ब्रूयात्, प्राणा आदित्या इदं मे तृतीयसवनं आयुरनुसंतनुत इति, मा हं प्राणानामादित्यानां मध्ये यज्ञो विलोप्सीय इति, उद्धैव तत एत्यगदो हैव भवति॥ छां. 3. 5. 16. 5-6

इदानीमस्य मनुष्यस्य अन्तिममष्टाचत्वारिंशत् वर्षात्मकं वयः, अर्थात् 69 तः 116 वर्षपर्यन्तमायुषः तृतीयखण्डः यज्ञस्य तृतीयसवनं भवति। अष्टाचत्वारिंशदक्षरात्मकं जगतीछन्दः। तृतीयसवने जगतीछन्दः भवति। तृतीयकालखण्डे आयुषि आदित्यनामकस्य प्राणस्य सम्बन्धः विद्यते। आदित्य एव प्राणः। अस्मिन् वयसि कापि व्याधिः जायते चेत् मनुष्यः एवं वदेत्। हे आदित्यसंज्ञकप्राण ! एषः मम आयुषः तृतीयखण्डः विद्यते। तस्य सम्पूर्त्या पूर्णायुष्कं मां करोतु । आदित्यप्राणः मम जीवनयज्ञस्य मध्ये लुप्तः मा भवतु। एवं प्रार्थनया मनुष्यः पूर्णायुमनुभवति।

एतद्ध स्म वै तद्विद्वान् आह महिदास ऐतरेयः।
स किं म एतदुपतपसि योऽहमनेन न प्रेष्यामीति,
स ह षोडशं वर्षशतं (116) अजीवत्।
प्र ह षोडशं वर्षशतं जीवति य एवं वेद॥ छा. 3. 5. 16. 7

जीवनस्यास्य तत्त्वज्ञाता विद्वान् महीदास ऐतरेय एकदा रुग्णः सन् एवमवोचत- हे रोग ! त्वं माम् किमर्थं तापयति ? अहमनेन न मरणं प्राप्नोमि। एवं निश्चयपूर्वकं उक्ते सः रोगमुक्तः जातः एवं 116 वर्षाणि पूर्णायुषं प्राप्नोत्। यः जीवनस्य तत्त्वज्ञानं जानाति स एव 116 वर्षपर्यन्तं



जीवितुं शक्नोति॥ प्रथमायुषस्य 24 वर्षपर्यन्तं, द्वितीयभागः 25 तः 68 वर्षपर्यन्तं 44 वर्षात्मकः कालः, आयुषं तृतीयभागः 69 तः 116 वर्षपर्यन्तं 48 वर्षात्मकः कालः भवति॥ एवं प्रकारेण मानवशरीरस्य पूर्णायुः 116 वर्षपर्यन्तं भवति।

9. शरीरस्य मानसिकचिकित्सापद्धतिः-

स्वस्य मनः सत्प्रवृत्तिद्वारा परिपूर्णं भवति। केवलं स्वार्थः अथवा अन्यस्य विनाशभावः मनसि न धारणीयः। तथा स्वस्य जीवनं सर्वजनोपयोगितया कार्यं विनियोक्तव्यं तदर्थं स्वस्य आयुषानुसारेण वसु-रुद्र-आदित्यदेवानां प्रार्थना अवश्यं करणीया। हे देव ! मम शरीरं रोगशून्यं भूत्वा दीर्घायुष्यं प्राप्नोतु। मम शरीरे त्वया प्रदत्ता अमृतशक्तिः विद्यते। तस्याः दिव्यशक्तेः उपयोगेनाहं रोगात्मुक्तः सन् निर्विघ्नेन सर्वहितार्थाय कार्यं करोमि। एवं मनसि विचारस्य धारणेन उच्चभावः जागरितः भवति, शरीरस्यान्तर्भागे जागरिता शक्तिः पुरुषं रोगमुक्तं करोति।

प्रत्येकस्य मनुष्यस्य शारीरिकावस्था, रोगस्य स्वरूपम्, एवं तस्य मनसः प्रभावशक्तिः, एवञ्च तस्य आत्मविश्वासस्य संयोगेन रोगनिमित्तं कापि कार्यं जायते। अतः मनसि विकल्पभावः मा भवतु। एतत्कार्यं भविष्यति अथवा न भविष्यति, कदाचित् न भवति एवमेव संदेहः अविश्वासः मनसि तिष्ठति चेत् कदाचित् कार्यसिद्धिर्न जायते। स्वस्य शरीरे विद्यमान प्रेरणाशक्तेः सञ्चालनेन मानसिकनिर्बलता दूरीभूत्वा तत्स्थाने जीवनरसस्य सञ्चारे शक्तिः प्राप्यते।

प्रायः मानवशरीरस्य दुर्बलतायाः कारणं ब्रह्मचर्यरहितजीवनम्, आत्मविश्वासविहीनं चिन्तनं, मानसिकबलस्य सम्यगुपयोगाभावः एव वर्तते। एतेषां सदुपयोगेन शरीरं सुदृढं, नीरोगं, स्वस्थञ्च भवति।

मनुष्यस्य शिरः ध्रुवोक्तः, अनेन सूर्यः नेत्ररूपं धृत्वा नेत्रस्थाने विद्यते, नासिकायां प्राणसञ्चारः भवति। नासिकास्थाने अश्विनी देवते विद्यते। मुखे वाणीरूपेण अग्निः विद्यते। दिशः कर्णे विद्यन्ते, जिह्वायां रुचः ग्रहणशक्तिश्च विद्यते, जलस्यैतत् स्थानम्। जलस्य रुचिः प्रसिद्धः। पृथ्व्याः गन्धः, जलस्य रुचिः, तेजसः रूपं, वायोः स्पर्शः, तथा आकाशस्य शब्दः इति पञ्चेन्द्रियद्वारा वयमनुभवं प्राप्नुमः।

तैत्तिरीयोपनिषदि एवं वर्ण्यते-

अन्तरेण तालुके । य एव स्तन इवावलंबते। सेन्द्रयोनिः।

यत्रासौ केशान्तो वर्तते। व्यपोह्य शीर्षकपाले॥ तै. 3. 1. 6. 2

यत्र शिरः एवं कपालस्य अस्थीनि विभक्तरूपेण दृश्यन्ते, यत्र केशानां विभागः दृश्यते, यः ताल्वोः उपरिभागे स्तनवत् लम्बमानः विद्यते, स एव इन्द्रशक्तेः उत्पत्तिस्थानं विद्यते। योगिनः ध्यानबलेन इन्द्रशक्तिं सावयित्वा शरीरस्य नवजीवनं कुर्वन्ति। अद्यतन वैद्याः अस्य इन्द्रग्रन्थेरर्कं निष्कास्य सूच्या शरीरे स्थापयन्ति। पीट्युटरी ग्लैंड नामक अर्कः आपणे लभ्यते। मनसः



धारणायामस्य रसस्य आत्मसात् करणं ऋषीणां मार्गः आसीत्। तथा सूच्या अस्य ग्रन्थस्य रसं शरीरे स्थापनं यूरोपीयानां मार्गं विद्यते। एवं प्रकारेण नैके ग्रन्थयः शरीरे विद्यन्ते।

सूर्यः चक्षुषि, दिशः कर्णे, प्राणः नासिकायाम्, अग्निदेवः नासिकायाम्, अग्निः मुखे, पृथ्वी पाददेशे, मृत्युः नाभौ, जलः रेतः भूत्वा पुरुष इन्द्रिये, चन्द्रमा हृदये, मरुत् श्वासकोषे, इन्द्रः मस्तिष्कस्य इन्द्रग्रन्थौ, इन्द्रस्य युद्धशक्तिः बाह्वोः, एवं रूपेण शरीरे विद्यन्ते। ब्रह्म हृदये तिष्ठति। अग्निः, विद्युत्, सूर्यः शरीरे स्थित्वा भिन्न भिन्नकार्याणि कुर्वन्ति। सूर्यचक्रं नाभेः पृष्ठभागे विद्यते। सूर्यशक्तिः अत्र स्थित्वा पाचनकार्यं करोति। सूर्यनमस्कारमाध्यमेन पाचनयन्त्रस्य उत्तेजनं प्राप्य विविधरोगात् पुरुषशरीरं मुक्तं भवति।

9. उपसंहारः

मानवजीवनं उन्नतं कर्तुं वेदविज्ञानं नितरां सर्वकालेषु उपकरोति। पूर्वं वेदविज्ञानाधारेण पूर्णमायुः निरामयाः भूत्वा अजीवन्। ते स्वजीवनं उन्नत्या सह लोकोन्नतिमप्यसाधयन्। अतः

सर्वे भवन्तु सुखिनः। सर्वे सन्तु निरामयाः।

सर्वे भद्राणि पश्यन्तु। मा कश्चित् दुःखभाग् भवेत्

इति प्रार्थना कथनमात्रं नासीत्। अपि तु अक्षिसात् कृता आसीत्। पुनरपि तादृशीं स्थितिं लोके द्रष्टुं वेदमार्गः आश्रयणीयः। इति शम्।

पारिभाषिकशब्दानां आँग्लानुवादः-

कालः (Evolutionary stage, time), उत्सर्पिणी (ascending, formative, evolutionary phase), अवसर्पिणी (descending, syntropy), पलितोपमार्धमायु (comparative life span), संहननं (multiplication and organization), शरीरमाकुञ्चन (Contraction), प्रसारण (Dilatation), केशिकसंहननं (cellular multiplication and organization), प्रज्ञसिपिशितं (intelligence eaters), वैद्याः (Doctors), सूच्या (siring), इन्द्रग्रन्थेः अर्क (pituitary gland) सूर्यचक्रः (solar plexus) II कण्डराः (Si new), कूर्चा (A bundle of main veins extending to two hands, two legs, head and penis).

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INDIAN CULTURE AND AYURVEDA SYSTEM WITH AN ADVANCE PREVENTIVE MEASURES AGAINST COVID-19: HERBAL MEDICINE WITH IMMENSE MULTIPLE BENEFITS AGAINST CORONA VIRUS

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ABSTRACT

An approach has been made by adopting Indian culture and Ayurveda system against COVID-19 with immense effect. Ayurveda system has enough potential and positive possibilities to be employed both for prevention and treatment of COVID-19. Implementation of Ayurveda system is to provide evidence-based strengthening the scope of Ayurveda beyond preventive health care and care for non-communicable diseases and viruses. As we are now familiar with AYUSH healthcare facilities which are being converting into quarantine facilities in times of need. From this perspective, hence by implementing the suggested intervention plan within AYUSH healthcare facilities by Ayurveda system workforce may benefit the nation immensely greatly. India is the country where the world's oldest living health care system has been originated and it is being carefully observed by the world community for how it handles the crisis using its very own resources. Ayurvedic medicine which focuses not only on disease management practices but also focuses on prevention and continued wellness indeed. Ayurvedic medicine's approach is unique in that it focuses on the root causes of diseases and offers an individualized plan for the persons, based on his or her body constitution (Prakriti). It has been since ancient times possess great effectiveness on pharmacological action as well as in contrast of the human beings living behavior and patterns.

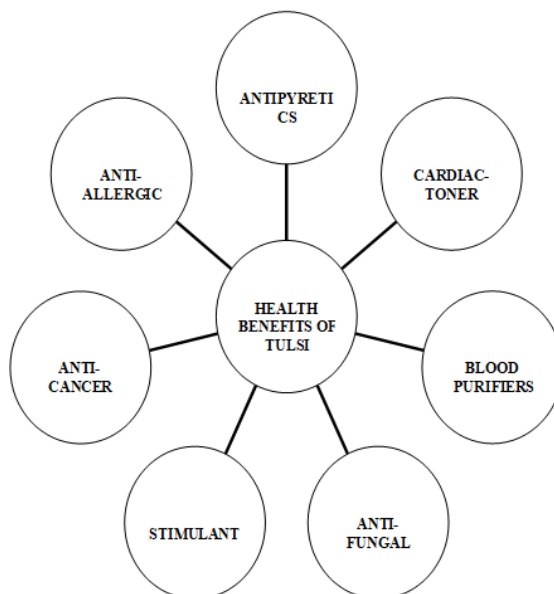
In this review article we are focusing Indian Culture that makes the great heal and giving our views on COVID-19 prevention. Various natural phytochemicals can be prior options for controlling and preventing COVID-19. Tulsi (*Ocimum sanctum*) and Ashwagandha (*Withania somnifera*) can be the first choice of herbs in our work to cure the COVID-19. As per the studied people with low immunity levels are supposed to be especially prone to the COVID-19 and now from the global doctors and practitioners are pumping in high doses of vitamin-C to boost immunity however if it may produce harm any individuals. After study about the herbal medicine ashwagandha, giloy and tulsi are immensely effective for fighting weak immunity which can be great preventive measure against the Covid-19 or Corona virus. Various reasons of Indian Culture which would be choice of adoptability against fighting COVID-19 which have been discussing in this article as well as the Tulsi benefits which could make the huge impact on the pharmaceutical preparation which is working to cure or to treat Corona virus. Tulsi is the most important herbal medicine mentioned in Indian History with important side. We will focus on the Tulsi benefits as it is the choice of candidate against COVID-19 with multiple benefits.



Keywords: Phytochemicals, Herbal Medicine, Ancient History, Ayurvedic System, Tulsi, Ashwagandha, Immunity, Giloy, boost immunity, Ashwagandha, Giloy, Vitamin-C, Ayush healthcare.

INTRODUCTION

As the outbreak of pneumonia reported in December, 2019 in Wuhan, China, which is now determined to be caused by a novel corona virus with deadly numbered of effect on human beings lives. It is named as Severe Acute Respiratory Syndrome(SARS). We have approximately 35,000 medicinal plants which are used for the therapeutic effect according to Ayurveda and siddha-unani and other traditional system which can be effective against COVID-19 with their active constituents analysis. In which ocimum sanctum(tulsi) is one of the most important plant now researchers focusing. It is employed in the treatment of various diseases such as antimicrobial infection, antifungal, anticancer, arthritis, chronic fever, antifertility, hepatoprotective, eye disease, antispasmodic, analgesic, antiemetic, and Cardio protective. This medicinal herb have also been shown to reduce blood glucose levels after studying its constituents. If we focus on its active constituents we may get in ocimum sanctum such as, oleanolic acid, rosmarinic acid, ursolic acid eugenol, , linalool, carvacrol, β elemene, β caryophyllene and germacrene. Tulsi is considered to have diuretic, stimulant property. Volatile oil, fixed oil also obtained from the leaves of medicinal herbs. Monoterpene are obtained from the volatile oils such as, camphene, myrcene, sabinene, in which some mono terpene produced oxygen such as linalool. To fight against COVID-19 tulsi active constituents could play important role. [28] [2] Recently as we know Corona virus 2 or it names as SARS-CoV-2 get spread to over 185 countries and about regions with more than 2.07 million confirmed cases and more than 1,34,355 deaths as of April 16, 2020 which is affecting continuesly and to prevent and to treat this COVID-19 is still the most challenging hence this Indian medicinal herbs tulsi could make the great impact as it has all the required ingredients. Despite worldwide efforts to contain the pandemic is continuing to spread for want of a clinically-proven prophylaxis and therapeutic strategy challenges. [15] [17] [19]



Indeed, it is important that scientific community and respective researchers must draw on pluralistic knowledge systems available globally and helps against COVID-19. Drawing on the original Ayurveda systems, contemporary scientific studies, and our experiential knowledge on similar clinical settings, we can propose a pragmatic plan for interventions. With the fact presently no system of medicine has any evidence-based treatment for COVID-19 still. Similar strategy is required to be implemented by Ayurveda system of medicine. Ayurveda interventions become more relevant by the fact, there is an elaborate description of causation and management of epidemic (Janapadodhwamsa) in Ayurveda system. If we make our views on COVID-19 we found 5% cases requiring intensive health care, the disease progression is gradual, and that requires about 9-12 days to progress from symptoms of Upper Respiratory Tract Infection (URTI) to Acute Respiratory Distress Syndrome (ARDS). ARDS which is followed by un-correctable hypotensive shock, multi-organ failure and eventually death. [28] [27]

There are several risk factors that get the people susceptible. Person who older age, he may have presence of co-morbidities such as diabetes, hypertension and cardiovascular disease, anorexia and presentation without fever will be extremely susceptible. As per the study on (SpO₂) reduced peripheral capillary oxygen saturation below 90% will be risk indicator in apparently mild cases.

And we focus on the treatment with Ayurvedic medicines. It general, involves by improving the digestive fire (Agni) to increase metabolism and eliminating toxins (Ama). And regular detoxification therapies called Panchakarma, which help in balancing doshas, which is followed by rejuvenation therapy (Rasayana) with specific herbs. Comparatively Ayurvedic medicines with modern medicine which can offer a more holistic approach in combating the current epidemic of obesity and chronic

metabolic diseases also. Tulsi (*Ocimum sanctum*) it is the family of Lamiaceae. [3] [6] [9] Tulsi is produced in India and Southeast Asia, and India is the largest source of medicinal plants in the whole world. The demand for Tulsi is increasing day by day for its medicinal purpose. The evidences of ethno pharmacology or ethno-medicine observed later in 60's, which explaining an approach to the discovery of single biologically active molecules, which has been used ever since the first compounds were isolated from plants. Hence every material, which uses as poisons, in pest control, in agriculture, as cosmetics, in fermentation processes and for religious purposes may have active substances that can be exploited as leads for drug development. Hence, this article work explaining traditional plants Tulsi benefits with their use because of the greater interest against COVID-19, with around 80% of the population of developing countries (according to WHO) now partially or fully dependent upon herbal drugs for extremely primary healthcare. It is remembered Since the ingredients were used as herbal, not only the ingredients often have added benefits that overall improve your health but there are chances of side effects of chemicals. [19]



Figure-1: Tulsi Leaves (*Ocimum Sanctum*) Holy herbs

With the treatment of Ayurvedic medicines we have its origins and evolutions, and the sciences behind, from the first, those who practice the Ayurvedic medicines, it was using the combination of medicines that often include essential oils, diet supplements and breathing exercises based on your DOSHA's or diseases. Which are ultimate irreducible basic metabolic elements of living beings, determines the process of growth and decay. The TRIDOSHIC system in Ayurvedic system which was the fundamental concept. They classified into VATA (Air, causes emaciation, tremors, constipation etc.), PITTA (Bile, which governs digestion, hunger etc.) and Kapha (Phlegm, that holds



together, gives lubrication, causes nausea, cough and lethargy when becomes excess). [18] [19]

The origin of Ayurvedic medicines and the knowledges, 'Samhitas,' or encyclopedia of medicine, which were written during the post Vedic era, and which included 'Charka Samhita' (900 BC), 'Sushruta Samhita' (600 BC) and Ashtanga Hridaya' (1000 CE). Adaptations and experiments with plants was mentioned in Rigveda and Ayurveda (Veda, there are 3 types, there was also a Juju Veda). Charka Samhita was the first recorded treatise on Ayurveda system, which having 8 sections divided into 150 chapters, and describing 341 medicinal plants.[15] On the other hand Ayurveda was Shushruta Samhita which having special emphasis on surgery, which describing 395 medicinal plants, 57 drugs from animal origin and around 64 minerals and metals as drugs, it is the origin of Ayurvedic system and Indian culture based oldest medicines systems with appropriate immersed therapeutics action. [1] [20] [22]

Uses of Holy Herb Ocimum Sanctum (Tulsi)

Several studies have been supporting the use of the entire plant of tulsi for human use and its therapeutic values. Tulsi contains important phytochemicals which can be effective treatment measure against viruses are:

1. Vitamin A and C
 2. Calcium
 3. Zinc
 4. Iron
 5. Chlorophyll
1. It reduces the stress and anxiety: All parts of the tulsi plant act as an adaptogen. Which is natural substance that helps your body to adapt stress and promotes mental balance and the concept of an adaptogen is a holistic activity, later in scientific research showed Tulsi has pharmacological properties to help your mind with several types of stress.[3] [4]It includes chemical, physical, infectious and emotional.
 2. It prevent against variuos infection and treat wounds: Tulsi having active ingredients prior boost the wound healing processes and also prevent against the infecions as it act asantibacterial, antiviral, anantifungal, anti-inflammatory, analgesic (painkiller)
 3. Scientific researchers also confessed tulsi work against various infection such as:
 - Mouth ulcers
 - Colloids
 - Raised scars
 - Acne
 4. It lowers theblood sugar levels: Scientific studies showed whole part of the plant tulsi may have the ingredients which prior could reduces the blood sugar level. Animal and human trials have shown that tulsi could help to prevent symptoms of diabetes such as:
 - weight gain
 - hyperinsulinemia, or excess insulin in the blood
 - high cholesterol
 - insulin resistance



- hypertension
 - 5. Tulsi reduces inflammation and relieve from joint pain: With the tackle stress, anxiety, and inflammation with a relaxing cup of tea made with the leaves of tulsi. As an adaptogen with anti-inflammatory and antioxidant properties tulsi have. Tulsi could even prevent the people from arthritis or fibromyalgia conditions.
 - 6. Tulsi may protect stomach from various disturbances: Tulsi can naturally increases stomach's disturbances, includes:
 - By decreasing stomach acid
 - On Increasing mucus secretion
 - By increasing mucus cells
 - With extending life of mucus cells
 - 7. Protect from dental plaque: Several researchers have concluded mouthwash containing 4% tulsi extract twice daily reduces plaque and gingivitis better than saline solution and similar to mouthwash containing 0.12% chlorhexidine. [3] [10] [14]
 - 8. It prevent from obesity: Later researchers recommended by taking tulsi leaves which help with weight loss or control of blood sugar or cholesterol.
 - 9. Other benefits of Tulsi may includes:
 - Common cold, influenza ("the flu"), asthma, bronchitis, earache, gingivitis and headache
 - Stomach upset, heart disease, fever, insomnia, viral hepatitis, malaria and tuberculosis
 - Mercury poisoning, ringworm and as antidote to snake and scorpion bite
- Phytochemical analysis of this tulsi medicinal herb commonly helpful as model for the synthetic of new medicine against the COVID-19. [4] [11]

METHODS AND MATERIALS

CHEMICALS REQUIREMENTS: Mayer reagent, Wagner's reagent, Lead ethanoate, Ferric chloride, Molisch's reagent, Alkaline reagent, Barford's reagent, Iodine solution, Ninhydrin solution and Sodium hydroxide, these reagents and chemicals used to test the presence of phytochemical active constituents of tulsi, which were analytical grade.

PLANT MATERIAL REQUIREMENT: We need few fresh Leaves of selected medicinal Tulsi plant. Fresh Tulsi leaves collected from the home garden.

METHOD OF PREPARATION

A. Processing of Tulsi Leaves

1. Fresh collected leaves now to avoid dusts leaves should thoroughly washed with tap water. then the dust free tulsi leaves were shade, and dried at room temperature.
2. Around after 1 week of period time the properly dried leaves now then grinding into the fine powder by using the grinding machine or blade cutter machine.
3. Then the powder material of tulsi leaves were weighed properly under electrical weighing machine. Then the fine powder of tulsi leaves was stored in a clean and tightly closed container.



Figure-2: Fresh Leaves Collected from Home Garden



Figure-3: Dried and Milled Leaves of the Tulsi

B. Preparation of Tulsi (*Ocimum sanctum*) extracts

1. Preparation of aqueous extract from tulsi leaves powdered, done by adding sufficient quantity distilled water in a container.
2. Firstly we take 40gm of powdered leaves of tulsi placed in 200 ml of beaker and 100 ml of distilled water poured into beaker after addition of water into the beaker we will left aside it for 24 hours at the room temperature.



Figure-4: Room temperature dried leaves of tulsi

3. After the desired wetting hours of active materials then dissolve in the respective solvent then, extract was filtered out by using filters cloth (muslin) then after with the the help of Whatmann number-1 filter paper prefer to filter any left residue.
4. The filtrate obtained as green in colour after completion of the process filtrate was dried. Finally, the residues were collected and used for the experiment.

The the obtained tulsi extract get the phytochemical analysis to find out the presence and absence of phytochemical constituents. The phytochemical tests is conduct to analysis the alkaloids, flavonoids, glycosides, proteins, fixed oil, carbohydrate, tannins, saponins, flavonoids and terpenoids. [5] [8]

EVALUATION METHODSPHYTOCHEMICAL ANALYSIS

A. Organoleptic characteristics of obtained tulsi aqueous extract

- I. Colour- Brown to Reddish in colour
- II. Odour- Flavonoid soothing odour
- III. Texture- Aqueous
- IV. Taste- Slightly aromatic sweetening
- V. Fractioned- Aroma

The obtained tulsi aqueous extract used in the various treatment it helps to relief the headache and diseases of head and neck. Tulsi leaves extract act as nerving tonic and reduces pimples, acne and scars effectively.

B. Evaluation of Phytochemicals using various reagent:

- I. Test for glycoside
- II. Test for tannin's
- III. Test for flavanoids
- IV. Test for alkaloids
- V. Test for oil
- VI. Test for proteins
- VII. Test for steroids

1. TEST FOR GLYCOSIDE

- Salkowski's test: 2ml of Chloroform were with 1ml of extract mixed to test the glycoside. Then 2ml of concentrated Sulfuric acid were added into it and then providing gently stirring.

Result: Reddish brown colour indicated the presence of glycoside.

- Keller test: 5 mg extract was taken in the test tubes and than add 1 ml of glacial acetic acid into it. After 4 drops of 2% solution of ferric chloride were mixed into it. Then 1 ml of concentrated Sulfuric acid were mixed into the mixture.

Result: Brown colour ring at the surface of the beaker will be formed which confirms in the presence cardiac glycosides.

2. TEST FOR TANNINS

- Gelatine test: 5 mg extract was taken and gelatine mixed into this extract and then 1ml of water was added into the solution.

Result: About white precipitate observed.

- Lead acetate test: 5 mg of test samples was taken in test tubes than 3 drops of basic lead acetate was added in the sample solution.



Result: Brown bulky precipitate obtained which confirmed tannin are present in test sample.

3. TEST FOR FLAVANOIDS

- Sodium hydroxide test: About 5 mg extract was taken in 1 ml of the 10% solution of sodium hydroxide was mixed then appearance of yellow colour solution observes after addition of 1ml of dilute Hydrochloric acid, in the presence of alkaloids the colour should be changed from yellow to colourless after addition of 2 ml of dilute hydrochloric acid.

Result: yellow to colourless changed confirmed flavanoids present.

- Alkaline reagent test: About 5 mg extract of tulsi taken in the test tube then mixed 2ml of 2% solution of Sodium hydroxide. if the formation of yellow which turned into colourless after addition of 3 drops of diluted acetic. It means that alkaloids are present in the tulsi extract.

Result: yellow to colourless changed confirmed flavanoids present.

4. TEST FOR ALKALOIDS

- Wagner's test: About 5 mg extract of tulsi taken in a test tube than 0.5 of wagner reagent was added and provided stirring. From reddish brown colour showing the alkaloids are present. Reddish brown colour because of iodine forms a complex which is insoluble and has the colour brown redish.

Result: Obtained the reddish brown colour.

- Mayer's test: About 5 mg extract of Tulsi was taken in the test tube and then added 1% hydrochloric acid, then the obtained solution providing heating. Then Red colour indicate the presence of alkaloids because Potassium mercuric iodine are present in Mayer's reagent.

Result: Red colour obtained.

5. TEST FOR OIL

- Saponification test: 5 drops of alcoholic potassium hydroxide and 0.5 ml of extract were taken into test tube and then mixed well. Then about 5 drops of phenolphthalein were added into the solution and mix. It was heated on water bath for 1 hour. Observing of partial neutralization of alkali which indicates the presence of oils and fats.

Result: Slightly alkali neutralizations observed.

- Stain test: 4 drops of the aqueous extract was spread through the filter paper, where the formation of oil on the filter paper will indicate the presence of oil in aqueous.

Result: Oil presence confirmed.

6. TEST FOR PROTEINS

- Million's test: About 5 mg extract was mixed with 2ml of Mallon's reagent. Then this solution was allow to heat for 6 minutes, then pink colour precipitated turns into red colour which confirmed the presence of protein into the tulsi extract.

Result: Precipitates turned into red in colour.

- Ninhydrin test: Few quantity of extract of tulsi was mixed with 2 ml of 0.2% solution of Ninhydrin and then allow it to boiled for 4 minutes on water bath, if violet colour appeared with the presence of amino acids and proteins in the aqueous extract.



Result: Violet colour observed.

7. TEST FOR STEROIDS

- Salkowski's test: About 4 drops of concentrated sulphuric acid was mixed into the 5 ml of tulsi extract. The formation of red colour indicates the presence of steroids.

Result: The red colour formed.

RESULTS AND DISCUSSION

Indian Culture would impact great effort to control and to prevent from the Covid-19. Hand saking would surely transfer the viruses to the host, Indian culture greetings, Hand Namasker gesture, would be implementation prevent from the transformation of the COVID-19, and tulsi hand sanitizer which is the herbal based no chemical ingredients it would be, immensely effective against the COVID-19. From the ancient history of the India, various measures already have been implemented which not only make the great impression but also effect the various life's. Tulsi one of the most important herbal medicine mentioned in our Indian History with greatest page, Tulsi is the plant which has all the required property one Against Covid-19 medicine should have, Tulsi which can effect the respiratory system with healing property and it's microbial property not only beneficial as intake formulation Into the article studies of our work shows the phytochemical investigation which discovered the presence of alkaloids compounds [Appearance of red colour]; flavonoids and tannins [The pink colour shows the presence of flavonoids and blackish precipitate which indicated the presence of tannins] in mentioned extracts of tulsi plant. Salkowski's test- [formation of brownish-red colour] showed positive result for aqueous extract. It showed aromatic- odour, taste – very slightly pungent, and the texture- smooth of *ocimum sanctum* were obtained. The phytochemical screening leaf extract of tulsi revealed the presence and absence of alkaloids, flavonoids and tannin compounds.

The medicinal plants tulsi is being used traditionally for the treatment of inflammation, wound healing, toothache, antiseptics, carminative, cough, expectorant, and several fungal infection. The antibacterial activity attributed to the presence of some active constituents in the extracts. Tulsi might be used as the sanitizers with appropriate other chemicals or individual it has the antibacterial activity, and it effectively respiratory actions which would be great choice for the present epidemic COVID-19.

CONCLUSION

The present work was individually the immense great outcomes against the COVID-19 epidemic. The result from whole study which confirming the use of *ocimum sanctum* plant as medicine is the great choice of herbal medicines from the ancient medicinal traditions. These are the ingredients obtained from the tulsi circsilinoleol, circimaritin, isothymusin, apigenin and rosameric acid, which may be useful against Corona-viruses, fever, syphilitic, ulcer, inflammatory disease wounds, such as antimicrobial infection, analgesic, antifungal, arthritis, anticancer, eye disease, antifertility, hepatoprotective, chronic fever, antispasmodic, antiemetic, cardio protective etc. In protective antioxidant supplement tulsi extract may be used after the analysis of certain tests. After this study it is assumed that the extract could be used for the new formulations and potent antimicrobial drugs against COVID-19.



Tulsi which is used in most Indian homes for its medicinal properties. Its known to having various impact on humans being as well as in environment some of these benefits including antimicrobial, anti-diarrheal, anti-oxidant and anti-inflammatory properties. We studied that tulsi phytochemicals can inhibit the corona virus replication which in turn helps to protect by controlling Covid-19, also Tulsi including other activities may helps on multiple protection against Coronavirus, Tulsi antimicrobial activities could be prepare as hand sanitizer with appreciate herbal and no side effects, with maximum action and also it could be prestigious choice of candidate against Covid-19 and can helps to prevent from growth and spread of Covid-19.

And the Giloy, which is greatly used for treating and preventing diseases such as diabetes, dyspepsia, jaundice, rheumatoid arthritis, inflammations, gout, cardiac debility, excess mucus, urinary disorders and asthma etc. The important phytochemicals reported in giloy (*Tinospora cordifolia*) are tinosporine, tinocordiside, diterpenoid furano lactone, tinosporaside, cordifolide, cordifol, syringin, clerodane furano diterpene, tinosporidine, b-sitosterol and tinosporide. Cordifolioside-A and syringin have reported to possess immunomodulatory activity. And the tinosporin, diterpenoid claimed specially for the treatment and preventing of the targeted viruses including (retroviruses) (HIV-1, HIV-2) all subgroups, HTLV, Herpes simplex Virus (HSV) and other viral diseases. The rich tinocordiside extracts of giloy would be one more important candidates for controlling COVID-19, which enter into host cells and the general immunomodulatory nature of giloy will be enhance innate immunity against COVID-19 infections.

As we observed and studied about the epidemic COVID-19 shown to engage the host cell, ACE2 which has protein spike receptor which act as the binding site (RBD). We have another good candidates natural *Withania somnifera* (ashwagandha), it have distinct effects on viral RBD and host ACE2 receptor complex. Which was found that *Withania somnifera* compound, Withanone, docked very well in the binding interface of AEC2-RBD complex into the host receptors activity, and it was observed to move towards the interface centre on simulation. The ashwagandha containing Withanone, which significantly decreased electrostatic component of binding free energies of ACE2-RBD complex. It shows that natural phytochemicals can be important options for controlling COVID-19 and *Withania somnifera* and tulsi which shall be the first choice of herbs in these directions to curb the COVID-19 infectivity under the current epidemic situations where not any absolute treatment available. This research work would be helpful to cure and to prevent the COVID-19.

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THE CONCEPT OF KAMMA IN BUDDHISM

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Abstract

In India before the emergence of Buddhism, many religious teachers introduced the term “*Kamma*” in different senses. They believed that the real salvation is through infliction of the flesh in order to save the soul. a complete understanding of *kammic* action and result enables beings to free themselves from *samsara* and attain liberation. Though the present form perishes another form which is neither the same nor absolutely different takes its place, according to the potential thought-vibration generated at the death moment, because the *kammic* force which propels the life-flux still survives. Thus, from a Buddhist point of view, our present mental, moral intellectual and temperamental differences are, for the most part, due to our own actions and tendencies, both past and present. All kinds of result are in one’s hand, one should be clever to choose the right way to secession the *samsara* life, attend to *Nibbana*. Once become a Brahmin, and Vasala not by the birth but it is according to their action or *Kamma*.

Key Points : Buddhism, *Kamma*, Liberation, *Samsara*, *Nibbana*, Thought-Vibration, Death

Introduction

Chapter 01: Introduction, The Number of Discourses, Brief Introduction to Them.

Kamma (Karma) is one of those words we don't translate. It's simple meaning is — action. *Karma* (Sanskrit, also *karma*, Pāli: *kamma*) is a Sanskrit term that literally means "action" or "doing".

In India before the emergence of Buddhism, many religious teachers introduced the term “*Kamma*” in different senses. Brahmanism interpreted *Kamma* on ritual practice or sacrifice. They emphasized more on ritual performance.

The founder of Jainism, Mahavira, who believed to be senior temporary of the Buddha, was also known as *Karmavada*, one who advocates *Karma*. But Jainism believes in a plurality of soul. The Jain interpretation of *Karma* is that *Karma* is some kind of subtle material which comes and sticks to the soul. There are varieties of *Puggala*, the species of subtle matter which comes and covers the soul. So the soul gets more and more colored itself.

Therefore in Jainism view, the way to salvation is to discharge and purge the former *Karmas*, not to accumulate new *karmas*, be practicing the strict asceticism. Jainism also went to the extreme of *Attakilamthanuyoga* (self-mortification). They believed that the real salvation is through infliction of the flesh in order to save the soul. Suffering is



necessary for the liberation of soul. Even Gotama Siddhartha was misled by this belief, and practiced asceticism for six years.

In the Buddhist tradition, the term *kamma* is used in two senses:

- On the specific level, *kamma* refers to those actions which spring from the intention (*cetanā*) of a sentient being. *Kammic* actions are compared to a seed that will inevitably ripen into a result or fruition (referred to as *vipāka* or *phala* in Sanskrit and Pali).
- On the general level, contemporary Buddhist teachers frequently use the term *kamma* when referring to the entire process of *kammic* action and result (Sanskrit: *karmaphala*).

In the Buddhist view, developing a genuine, experiential understanding of *kammic* action and result—how all of one's actions will have a corresponding result—is an essential aspect of the Buddhist path. *Kammic* actions are considered to be the engine which drives the cycle of uncontrolled rebirth (*samsara*) for sentient beings; correspondingly, a complete understanding of *kammic* action and result enables beings to free themselves from *samsara* and attain liberation.

In Buddhism, *Kamma* is also a law of cause and effect, but as our Buddhism Expert Barbara O'Brien points out, many westerners use the term "*Kamma*" to refer to the results of *Kamma*, rather than the action itself. She explains that to Buddhists, *Kamma* is non-linear, and has multiple loops and turns. This means, she says, "Although the past has some influence on the present, the present also is shaped by the actions of the present."

In modern Paganism, *Kamma* is often interpreted slightly differently than as a law of cause and effect. Instead, it's sometimes seen more as a cosmic payback. Do good things and you'll have good things happen to you? Treat people badly, and someday, *Kamma's* going to catch up with you, and respond accordingly.

Much like the Wiccan rule of three and the Law of Attraction, *Kamma* doesn't always work in a way that we see as fair or just. If it did, people who are jerks would always have bad things happening to them. Those who are good and pleasant would be surrounded by nothing but good things. The fact is that – at least on the material plane – that's not always the case.

Some people try to see *Kamma* as a variation on the law of physics - for every action, there is a reaction. It may be good, it may be bad, it may impact you now and it may impact you later, but it will indeed take place eventually.

So, is *Kamma* real? No one can answer that question with any degree of certainty. After all, much like many other questions in the metaphysical realm, everyone is going to have their own unverifiable personal gnosis that colors their answer.

However, it's probably safe to say that if you can live this life in a way that is honorable, fair, and acceptable to your own moral standards and to those of the people who are important to you, then it doesn't matter whether you're building up *Kamma* points for the next lifetime or not.



Chapter 02: The Classification of Kamma Doctrine in Buddhism.

With respect to different functions, *kamma* is classified into four kinds:

1. JANAKA REPRODUCTIVE KAMMA

Every birth is conditioned by a past good or bad *kamma*, which predominated at the moment of death. *kamma* that conditions the future birth is called Reproductive kamma. The death of a person is merely 'a temporary end of a temporary phenomenon'. Though the present form perishes another form which is neither the same nor absolutely different takes its place, according to the potential thought-vibration generated at the death moment, because the *kammic* force which propels the life-flux still survives. It is this last thought, which is technically called Reproductive kamma, which determines the state of a person in his subsequent birth. This may be either a good or bad *kamma*.

According to the Commentary, Reproductive kamma is that which produces mental aggregates and material aggregates at the moment of conception. The initial consciousness, which is termed the *patisandhi* rebirth consciousness, is conditioned by this Reproductive (*janaka*) Kamma. Simultaneous with the arising of the rebirth-consciousness, there arise the 'body-decade', 'sex-decade' and 'base-decade' (*kaya-bhavavattitudasakas*).

(a) The body-decade is composed of:

1. The element of extension (*pathavi*).
2. The element of cohesion (*apo*).
3. The element of heat (*tejo*).
4. The element of motion (*vayo*).

(b) The four derivatives (*upadanarupa*):

1. Colour (*vanna*).
2. Odour (*gandha*).
3. Taste (*rasa*).
4. Nutritive Essence (*oja*).

These eight (*mahabhuta* 4 + *upadana* 4 = 8) are collectively called *Avinibhoga Rupa* (invisible form or invisible matter).

(c) Vitality (*jivitindriya*) and Body (*kaya*)

These (*avinibhoga* 8 + *jivitindriya* 1 + *Kaya* 1 = 10) ten are collectively called "Body-decade" = (*Kaya dasaka*).

Sex-decade and Base-decade also consist of the first nine, sex (*bhava*) and seat of consciousness (*vathu*) respectively.

2. SUPPORTIVE KAMMA

Supportive kamma is that which comes near the Reproductive (*janaka*) Kamma and supports it. It is neither good nor bad and it assists or maintains the action of the Reproductive (*janaka*) Kamma in the course of one's lifetime. Immediately after conception till the death moment this *kamma* steps forward to support the Reproductive kamma.



3. OBSTRUCTIVE KAMMA OR COUNTERACTIVE KAMMA

Which, unlike the former, tends to weaken, interrupt and retard the fruition of the Reproductive kamma. For instance, a person born with a good Reproductive kamma may be subject to various ailments etc., thus preventing him from enjoying the blissful results of his good actions. An animal, on the other hand, who is born with a bad Reproductive kamma may lead a comfortable life by getting good food, lodging, etc., as a result of his good counteractive or obstructive (*upabidaka*) kamma preventing the fruition of the evil Reproductive kamma.

4. DESTRUCTIVE (UPAGHATAKA) KAMMA

According to the law of *kamma* the potential energy of the Reproductive kamma could be nullified by a mere powerful opposing *kamma* of the past, which, seeking an opportunity, may quite unexpectedly operate, just as a powerful counteractive force can obstruct the path of a flying arrow and bring it down to the ground. Such an action is called Destructive (*upaghataka*) kamma. It is more effective than the previous two in that it is not only obstructive but also destroys the whole force.

(B) There is another classification of *kamma*, according to the priority of effect:

1. WEIGHTY (*Garuka*) KAMMA.

This is either weighty or serious – may be either good or bad. It produces its results in this life or in the next for certain. If good, it is purely mental as in the case of *Jhana* (ecstasy or absorption). Otherwise it is verbal or bodily. On the Immoral side, there are five immediate effective heinous crimes (*pancanantariyakamma*): Matricide, Patricide, and the murder of an *Arahant*, the wounding of a Buddha and the creation of a schism in the Sangha.

2. PROXIMATE (*Asanna*) KAMMA OR DEATH-PROXIMATE KAMMA

This is that which one does or remembers immediately before the moment of dying. Owing to the great part it plays in determining the future birth, much importance is attained to this deathbed (*asanna*) kamma in almost all Buddhist countries. The customs of reminding the dying man of good deeds and making him do good acts on his deathbed still prevails in Buddhist countries.

Sometimes a bad person may die happily and receive a good birth if he remembers or does a good act at the last moment. A story runs that a certain executioner who casually happened to give some alms to the Venerable Sariputta remembered this good act at the dying moment and was born in a state of bliss. This does not mean that although he enjoys a good birth he will be exempt from the effects of the evil deeds which he accumulated during his lifetime. They will have the due effect as occasions arise.

At times a good person may die unhappy by suddenly remembering an evil act of his or by harboring some unpleasant thought, perchance compelled by unfavorable circumstances. In the scriptures, Queen *Mallika*, the consort of King *Kosala*, remembering a lie she had uttered, suffered for about seven days in a state of misery when she lied to her husband to cover some misbehaviour.

3. HABITUAL (*Accina*) KAMMA

It is that which on habitually performs and recollects and for which one has a great liking. Habits whether good or bad becomes one's second nature, tending to form the character of a person. At unguarded moments one often lapses into one's habitual mental mindset. In the same way, at the death-moment, unless influenced by other circumstances, one usually recalls to mind one's habitual deeds.

Cunda, a butcher who was living in vicinity of the Buddha's monastery, died yelling like an animal because he was earning his living by slaughtering pigs.

4. RESERVE OR CUMULATIVE (*Katatta*) KAMMA.

This literally means 'because done'. All actions that are not included in the aforementioned and those actions soon forgotten belong to this category. This is, as it were the reserve fund of a particular being.

(C) There is another classification of *kamma* according to the time in which effects are worked out:

1. Immediately Effective (*Ditthadhammavedaniya*) *kamma*.
2. Subsequently Effective (*Uppapajjavedaniya*) *kamma*.
3. Indefinitely Effective (*Aparapariyavedaniya*) *kamma*.
4. Defunct or Ineffective (*Ahosi*) *kamma*.

Immediately Effective *kamma* experienced in this present life. According to the Abhidhamma one does both good and evil during the *javana* process (thought-impulsion), which usually lasts for seven thought-moments. The effect of the first thought-moment, being the weakest, one may reap in this life itself. This is called the Immediately Effective *kamma*.

If it does not operate in this life, it is called 'Defunct or Ineffective' *kamma*.

The next weakest is the seventh thought-moment. Its effect one may reap in the subsequent birth. This is called 'Subsequently Effective' *kamma*.

This, too, is called Defunct or Ineffective *kamma* if it does not operate in the second birth. The effect of the intermediate thought-moments may take place at any time until one attains *Nibbana*. This type of *kamma* is known as 'Indefinitely Effective' *kamma*.

No one, not even the Buddhas and Arahantas, is exempt from this class of *kamma* which one may experience in the course of one's wandering in *Samsara*. There is no special class of *kamma* known as Defunct or Ineffective, but when such actions that should produce their effects in this life or in a subsequent life do not operate, they are termed Defunct or Ineffective *kamma*.

(D) The last classification of *kamma* is according to the plane in which the effect takes place, namely: vs. actions

The Buddha spoke of wholesome actions (P. *kusala-kamma*, S. *kuśala-karma*) that result in happiness, and unwholesome actions (P. *akusala-kamma*, S. *akuśala-karma*) that result in unhappiness.

In MN 3.66, the Buddha explained that it was impossible for virtuous action to produce unfavorable results, and for non-virtuous action to produce favorable results.[39] For example, a good deed may produce merit which ripens into wealth; however, if that deed was done too casually or the intention behind it



was not quite pure, that wealth so obtained sometimes cannot be enjoyed (AN.4.392-393).

1. Evil Actions (*akusalakamma*) unwholesome which may ripen in the sentient planes (*kammaloka*). (Six celestial planes plus one human plane plus four woeful planes = eleven *kamalokaplanes*.) Here are only four woeful *kamalokas*.
2. Good Actions (*kusalakamma*) Wholesome which may ripen in the sentient planes except for the four woeful planes.
3. Good Actions (*kusalakamma*) which may ripen in the Realm of Form (*rupabrahamalokas*). There are four *ArupaBrahma Lokas*.

Chapter 03: Basic Concept of Kamma Found in Discourses(Suttas) and Commentarial.

According to the Lakkhana Sutta of Digha Nikaya, the Buddha inherited exceptional features, such as the 32 major marks, as the result of his past meritorious deeds. The ethical reason for acquiring each physical feature is clearly explained in the Sutta.

It is obvious from this unique case that *karmic* tendencies could not only influence our physical organism, but also nullify the potentiality of the parental cells and genes – hence the significance of the Buddha's enigmatic statement, - "We are the heirs of our own actions."

Dealing with this problem of variation, the *Atthasalini*, being a commentary on the Abhidharma, states:

"Depending on this difference in Karma appear the differences in the birth of beings, high and low, base and exalted, happy and miserable. Depending on the difference in Karma appears the difference in the individual features of beings as beautiful and ugly, high-born or low born, well-built or deformed. Depending on the difference in Karma appears the difference in worldly conditions of beings, such as gain and loss, and disgrace, blame and praise, happiness and misery."

Thus, from a Buddhist point of view, our present mental, moral intellectual and temperamental differences are, for the most part, due to our own actions and tendencies, both past and present.

Although Buddhism attributes this variation to *Karma*, as being the chief cause among a variety, it does not, however, assert that everything is due to *Karma*. The law of Karma, important as it is, is only one of the twenty-four conditions described in Buddhist Philosophy.

Refuting the erroneous view that "whatsoever fortune or misfortune experienced is all due to some previous action", the Buddha said:

"So, then, according to this view, owing to previous action men will become murderers, thieves, unchaste, liars, slanderers, covetous, malicious and perverts. Thus, for those who fall back on the former deeds as the essential reason, there is neither the desire to do, nor effort to do, nor necessity to do this deed, or abstain from this deed."

In Kammam Sutta of Samyutta Nikaya



The blessed one explained that "Monks, I will teach you about new kamma and old kamma, about the ceasing of *kamma* and the path that leads to the ceasing of *kamma*. Listen well, pay close attention and I will speak.

"What, monks, is old kamma?"

"The eye [ear, nose tongue, body (touch), mind], monks, is to be regarded as old kamma, brought into existence and created by volition, forming a basis for feeling. This, monks, is called 'old kamma.'

"And what, monks, is new kamma?"

"The action one performs now by body, speech and mind. This monks, is called 'new kamma.'

"When, monks, by ceasing actions of body, speech and mind, one touches liberation, this, monks, is called 'the ceasing of kamma.'

In AnguttaraNikaya of sutta pitaka The Buddha says: "*I declare, O Bhikkhus, that volition is kamma. Having willed one acts by body, speech, and thought.*"

Every volitional action of individuals, save those of Buddhas and Arahants, is called *kamma*. The exception made in their case is because they are delivered from both good and evil; they have eradicated ignorance and craving, the roots of *kamma*.

"*Destroyed are their germinal seeds (Khinabija); selfish desires no longer grow,*" states the Ratana Sutta of Sutta nipata.

This does not mean that the Buddha and Arahants are passive. They are tirelessly active in working for the real well-being and happiness of all. Their deeds ordinarily accepted as good or moral, lack creative power as regards themselves. Understanding things as they truly are, they have finally shattered their cosmic fetters – the chain of cause and effect. It is this doctrine of *kamma* that the mother teaches her child when she says "*Be good and you will be happy and we will love you; but if you are bad, you will be unhappy and we will not love you.*" In short, *kamma* is the law of cause and effect in the ethical realm.

According to SanyuttaNikaya of sutta pitaka states: *Kamma* is a law in itself, which operates in its own field without the intervention of any external, independent ruling agency.

In the AmbalatthikaRahulovada Sutta of Majjhimanikaya, the preaching of *Kamma* is explained well. The social sense of teaching of *kamma* in Buddhism is the criteria of good and bad at the very moment (of performing actions).

1. Actions, which are good for oneself and not good for others
2. Actions, which are good for others and not good for oneself
3. Actions, which are not good for oneself and also to others
4. Actions, which are a benefit for oneself as well as to others

No. 1 to 3 are *Akusala* and they should be avoided. No. 4 is *Kusala* and that should be done. This should be understood and should be investigated by wisdom. And this implies to mundane and super-mundane.

One can refer the Nibbedika Sutta Discourse of Gautama Buddha to learn about Cetana (Intention) and Kamma (Action). A most used part of a Sutta passage for this effect is '*Cetanāhambhikkhavekammamvadāmi*' Indeed when the above is mentioned there is an often omitted section which goes together with the above sutta passage.



That is 'Cetanàhambhikkhavekammamvadàmi,
cetayitvākammamkarotikāyenavācāyamanasā' (Nibbedhikasuttam).

In Cula-kammavibhanga Sutta it mentions that "Master Gotama: what is the reason, what is the condition, why inferiority and superiority are met with among human beings, among mankind? For one meets with short-lived and long-lived people, sick and healthy people, ugly and beautiful people, insignificant and influential people, poor and rich people, low-born and high-born people, stupid and wise people. What is the reason, what is the condition, why superiority and inferiority are met with among human beings, among mankind?

Student, beings are owners of kammās, heirs of kammās, they have kammās as their progenitor, kammās as their kin, kammās as their homing-place. It is kammās that differentiate beings according to inferiority and superiority.

Chapter 04: Conclusion

While the concept of kamma may have originated in ancient Indian beliefs, Buddhism has evolved to reach rather different conclusions.

Finally, according to Buddhism each action is a seed. Seed become Kamma, then, describes how our actions evolve into experience, internally and externally. Each action is a seed which grows or evolves into our experience of the world. Every action either starts a new growth process or reinforces an old one as described by the four results. Small wonder that we place so much emphasis on mindfulness and attention. What we do in each moment is very important!

Therefore the Buddha said *"for the final cessation of suffering all Kamma, wholesome and unwholesome, must be transcended, must be abandoned. Putting aside good and evil, one attains Nibbana. There is no other way"*

According to the details, what are given in the chapter one it give us a clear picture about the kamma and what it is as well as what are the views of other tradition on the kamma doctrine. Chapter two it give us a clear chart about the way where is the kamma start, which way it's from and how it is going to cessation .

In this way, while going through a difficult period of painful reaction –force results, you are at least building up within your mental structure new progressing reaction –forces, thus using the situation to its best advantage.

Finally all deeds as action or Kamma follows to present result accordingly their action if is good Kamma the result will be good .there is no way to can experience good result in evils doer life.

In chapter three give us a great advice and father explanation of kamma which we found in discourse and commentaries.

In the teaching of the Buddha it maintain that *"yadhisamvapatebijam, ta dhisamhartephalam"* whatever planted, the fruit will be that.

According to Yamakavagga of Dhammapada it says that

*"manopobbamgamadhamma- manosetthamanomaya
manasacepadutthena- bhasativakarotiva
tatonamdukkhamanveti- cakkam'vavahatopadam"*



It means all thoughts begin in the mind; mind is supreme and mind-made are they, if one speaks or acts with impure mind pain follows him like the wheel the hoof of the ox. On other hand if one speaks or acts with pure mind “*manasacepasannena*” happiness follows him like one’s shadow that never leaves.

All kinds of result are in one’s hand, one should be clever to choose the right way to secession the *samsara* life, attend to *Nibbana*.

Once become a Brahmin, and Vasala not by the birth but it is according to their action or Kamma.

However, it is interesting to note that, with the subsequent development of Buddhism, it is not uncommon for the average people who claim to be Buddhists to mistakenly harbor a view of karma/rebirth in a manner which is closer to Brahmanism than Buddhism.

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A STUDY OF GENDER DIFFERENCES IN IMPULSIVITY AND VIRTUAL FREEDOM AMONG INDIAN UNDERGRADUATE SOCIAL NETWORKING SITES USERS

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Abstract

A term which best suits today's world is wired world (tangible or intangible) in which (most of the cases) individuals are connected with each other through wires of internet. It is correct to say that social networking sites have become an indispensable part of today's life across all age groups for carrying out different purposes. Good number of studies is embedded in literature signifying the presence of significant student population on social networking sites and exploring gender differences in using different virtual platforms. But there is dearth of studies that examine impulsivity as well as virtual freedom (also with gender difference) among college going students. The study aimed at examining gender differences in impulsivity and virtual freedom among Indian undergraduate social networking sites (SNS) users. Social networking sites Addiction Scale by Shahnawaz et al. (2013) was used on sample of 793 Indian undergraduate SNS users. t-test analysis revealed that male undergraduate SNS users were found to be more impulsive in SNS usage where as their female counterparts enjoy more virtual freedom in social networking sites. This study helps psychologists to have an understanding of behavior exhibited by male and female Indian undergraduate SNS users on social networking sites.

Keywords: Impulsivity, Undergraduates, Virtual Freedom, Social networking sites, Social Networking Sites Users.

Introduction

Humans, being a social being always live in social networks for satisfaction of his physical and social needs. To maintain interpersonal relationships and liveliness in social groups, communication is an unavoidable tool used by people. So, Homo sapiens evolved various ways like use of letters, posts, and telephones to make communication within the group possible. Birth of internet and social networking sites add speed and accessibility to other part of the earth to communication modes and patterns of human beings. Today's world relies more on virtual platform for different types of purposes like shopping, business deals and meetings, to gain information about health and fitness, economics of market, sharing of videos, disclosure of self and many more. This is substantiated by various studies like Kemp in 2018 documented that 4 billion people are active users of social networking sites. Similar pattern is replicated by adolescents and adults as good amount of time is spent by them on various social networking sites as explored by (Thanuskodi and Raju et al., 2015). The so much involvement of youth in virtual world provokes social scientists community to explore association (if any) with other psychological variables.



Good volume of literature is available exposes the relationship of SNS usage with depression, anxiety, self-esteem, interpersonal relationships, academic performance, resilience, mental health with students as target population. Day- by- day review related with virtual world and its effect on students has been updated by researchers worldwide. A scrutinized look into literature uncovers the fact that there is dearth of studies related to impulsivity and virtual freedom which a social networking site users experiences in SNS world.

The meaning of terms impulsivity and virtual freedom can be extracted from Social networking addiction scale by Shahnawaz et al. (2013). Impulsivity is the tendency to act without any forethought, to act in a whim. This factor is associated with users' inability to control their urge to go back online. Virtual freedom is the sense of being free to do what a user wants in the online world due to uncountable possibilities provided by the virtual space. This factor is an attempt to fill the gap regarding studies related to impulsivity and virtual freedom in literature. As previous researchers documented that social networking sites are quite popular among students (Manjunatha, 2013). So the sample of research paper will be Indian university undergraduates who are active users of social networking sites. Hence the primary objective of present research paper is to explore gender differences in impulsivity and virtual freedom among Indian undergraduate social networking sites users. This research study will be beneficial for psychologists to have a better understanding of behavior exercised by male and female Indian undergraduates SNS users on social networking sites.

Review of related literature

Manjunatha (2013) conducted a survey on 500 Indian college students regarding use of social [networking sites among them. Results of the study highlighted that majority of the students were active users of social networking sites. Male SNS users were found to be more active users of SNS as compared to their female counterparts.

Raju et al. (2015) investigated the extent of social networking sites usage in adolescents by carrying out survey on 350 college students. The findings revealed that most of the students logged in to social networking sites for more than 30 minutes a day and most of the students were dependent on these sites. Results further stated that students of 18 to 24 years of age are prolific users of SNS.

Thanuskodi (2015) examined the use of social media among 460 college students. Analysis and interpretation of the data suggested that majority of college students were actively using social networking sites for sharing of information and chatting with friends. Additionally, results also documented that male SNS users visit SNS daily as compared to their female counterparts.

Kim & Yoo (2016) explored age and gender wise differences in social networking sites usage and its effects on 236 South Korean students in Higher



education. Statistical treatment of the data reveals that gender differences exist in social networking sites usage with females spending more time on social networking sites.

Objectives of the study

1. To find out gender differences in impulsivity among Indian male and female undergraduate social networking sites users.
2. To find out gender differences in virtual freedom among Indian male and female undergraduate social networking sites users.

Hypotheses of the study

1. There will be no significant gender differences in impulsivity among Indian male and female undergraduate social networking sites users.
2. There will be no significant gender differences in virtual freedom among Indian male and female undergraduate social networking sites users.

Methodology

(a) Study design and setting

Descriptive approach of research with ex-post-facto design was used to obtain objectives of the study.

(b) Universe and Sample

The universe of study consisted of first year undergraduate students of Indian Universities. Undergraduates pursuing Bachelor courses in Arts and Commerce stream in Punjabi University, Patiala; Guru Nanak Dev University, Amritsar and Panjab University, Chandigarh along with their constituent colleges and regional centres constitute the sample of study. The sample of 793 undergraduate students (275 female and 518 male) who falls in the age range from 16-21 years and have atleast six months experience on different social networking sites form part of the present research study. Undergraduate students who were passive on social networking sites were not included in this study.

(c) Tools used

Social networking sites Addiction Scale (SNAS) by Shahnawaz et al. (2013) was used to assess social networking sites usage level of undergraduate students. This 32 item scale is 5 point Likert scale containing three factors i.e. impulsivity, negative outcome and virtual freedom. This scale possesses good reliability and discriminant validity among three factors.

(d) Data collection

Permission was sought from Heads of different educational institutions prior to data collection to visit and conduct survey on undergraduate students. An informal consent was also obtained from participants before filling of standardized scale. SNAS scale was

distributed to students and instructions were made clear before collecting their responses.

(e) Statistical treatment of data

To study gender wise differences in impulsivity and virtual freedom among Indian undergraduate social networking sites users, means, standard deviation and t-test was employed on collected data.

Analysis and interpretation

t-test was used to explore gender wise differences in impulsivity among Indian undergraduate students. The result of t-test is tabulated in Table 1 and Table 2

Table 1-Gender wise differences in Impulsivity among Indian undergraduate

social networking sites users

Gender	Mean	N	SD	t-value	Significance level
Females	39.13	275	10.74	4.36	Significant at 0.01 level
Males	43.54	518	17.55		

It can be seen from Table 1 that mean scores of impulsivity for female and male undergraduates is 39.13 and 43.54 respectively. The calculated t-value came out to be 4.36 which is significant at 0.01 level. This reveals that gender differences exist on impulsivity among Indian undergraduates SNS users with males being more impulsive in SNS usage as compared to females. Hence, hypothesis I, *There will be no significant gender differences in impulsivity among Indian male and female undergraduate social networking sites users*” is rejected.

Table 2

Gender wise differences in Virtual Freedom among Indian undergraduate social networking sites users

Gender	Mean	N	SD	t-value	Significance level
Females	26.21	275	3.90	5.99	Significant at 0.01 level
Males	24.40	518	4.30		

It can be seen from table 2 that mean scores of virtual freedom for female and male undergraduates is 26.21 and 24.40 respectively. The calculated t-value came out to be 5.99 which is significant at 0.01 level. This reveals that males and female undergraduate SNS users differs on virtual freedom with females experiencing more virtual freedom than their opposite counterparts. Hence, hypothesis II, *There will be no significant gender differences in virtual freedom among Indian male and female undergraduate social networking sites users*” is rejected.



Findings & discussions of the results

One of the finding of the study uncovers the fact that male undergraduate social networking sites users found to be more impulsive in their SNS usage when compared with their female counterparts. Due to this urge to mark their presence in social networking sites world they are losing track of real time of real world. This can be interpreted as males spend more time in virtual world rather than in real world which is supported by the findings of (Arumugam et al.,2014 & Manjunatha,2013) and not in queue with results documented by (Kim & Yoo,2016) that support opposite fact.

Other finding of study disclosed that female undergraduate social networking sites users enjoy more virtual freedom on social networking sites as compared to their opposite counterparts. Female counterparts relate themselves as free in virtual world. Female undergraduate SNS users feel relieved as they can easily express their emotions online. No social codes makes social networking sites exciting place for females as they can have anonymous friends. Data compiled by FinancesOnline.com (2015, mentioned in brandwatch.com) stands in support of present finding by documenting that women use social networking sites to share more personal information and they are more expressive and willing to share on social networking sites.

This study shed lights on behavior due to (Indian male undergraduate SNS users) and by (Indian female undergraduate SNS users) on social networking sites. Findings of the study suggested that informative sessions must be organized by educational authorities to make Indian undergraduate (specifically male) aware about the psychological costs of being a heavy SNS user. Male undergraduates must be kept busy in outdoor activities to curb the urge of being online most of the time. Furthermore more freedom experienced by female undergraduate SNS users in virtual world by sharing their thoughts is an indicative of the fact that still a female in a society is unable to express her true emotions in a free manner which may have negative consequences on her psychological aspect. This directs that still a conducive, productive and positive environment is still needed for female in a society to be most expressive without any fear. Secondly sharing too much information by female undergraduates can make them susceptible to risk of cyber-bullying and online crimes. This directs that guiding sessions should be organized specifically for female undergraduate SNS users to acquaint them about dangers of over sharing on online media. Furthermore students must be schooled properly about what to share and what not to share in online platforms to prevent them from being a victim of cybercrimes. Both the findings lend support to psychologists to understand type of counseling needed for both genders (male and female) as per SNS usage.

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A STEP TOWARDS ENHANCEMENT OF SHELF LIFE OF SUGARCANE JUICE

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Abstract:

Sugarcane juice has a typical shelf life of about 6 hours without treatment because its contents being simple sugars which spoil the juice faster converting it to acid and alcohol. Its shelf life was experimentally increased by pasteurization at 62°C for 30mins. Pasteurization increased shelf life to 60days when stored at room temperature and to 90 days when stored at low temperature after treatment. The major drawback of pasteurization is that it degrades colour, flavour as well as quality parameters because heat is involved in the process. Ozone is a non-thermal treatment. Ozone can be used to inactive microbial load to extend the shelf life of the juice. Ozone destroys microorganisms by progressive oxidation of vital cellular components and residual ozone decomposes to nontoxic product (i.e. oxygen)making it eco-friendly antimicrobial agent for use in the jaggery production. Furthermore fermentation of that ozonated juice can be done for the production of ethanol. Ozonation will reduce the microbial load that will interfere and cause contamination during fermentation. Ozonation will slightly reduce the nutritional and sensory properties of the juice. But as compared to pasteurization the losses will be less.

Keywords:Ozonation, Sugarcane Juice, Pasteurization, Fermentation

Introduction

:

Sugarcane juice is the liquid extracted from sugarcane. It is consumed as a beverage in many places, especially where sugarcane is commercially grown. Sugarcane is one of the main crops used in the production of sugar: (14)70% of the world's sugar is made from sugarcane However; this isn't the case for the sugarcane grown in India which happens to be the second largest producer of sugarcane. A lot of the sugarcane grown in India is first used to make jaggery followed by unrefined or brown sugar, and then sugar which is processed using chemicals and sulphur. (12)The remaining fibrous mass can be used as fuel, or to make paper or sound insulating boards and in some countries its used even to make alcohol. .Nutritional value of Sugarcane: The juice Sugarcane per serving (28.35 grams) contain Energy-111.13 kJ (26.56 kcal), Carbohydrates-27.51 g, Protein-0.27 g, Calcium11.23 mg (1%), Iron 0.37 mg (3%), Potassium41.96 mg (1%), Sodium17.01 mg (1%)

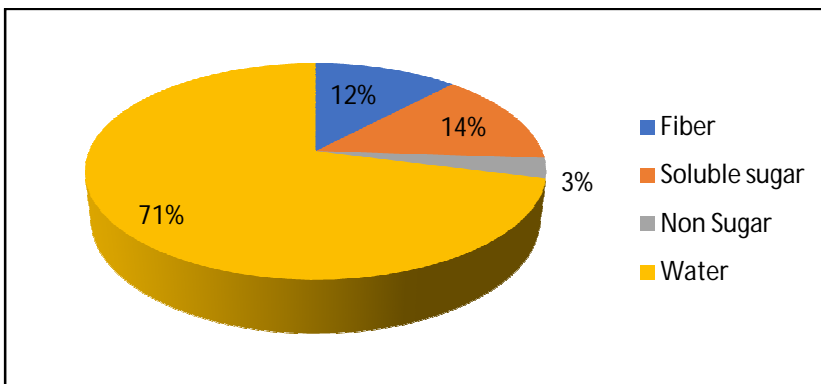


Fig1:Main Composition of Sugarcane juice

Sterilization refers to any process that eliminates, removes, kills, or deactivates all forms of life (in particular referring to microorganisms such as fungi, bacteria, viruses, spores, unicellular eukaryotic organisms such as Plasmodium, etc.) and other biological agents like prions present in a specific surface, object or fluid, for example food or biological culture media. Sterilization can be achieved through various means, including heat, chemicals, irradiation, high pressure, and filtration. (13)

Some other important parameters of sugarcane juice:

The analysis of the quality indexes of sugarcane juice plays a vital role in the process for its further use.

1. Pol Content: Studies have recorded that the change trend of polarization is consistent with the change trend of sucrose content in juice. This shows a strong correlation between them. (8)
2. Reducing Sugars: It has been proved from many research works that reducing sugar is low when the sugarcane is ripe and reducing sugar is high when the sugarcane is immature or overripe; especially when the quality of sugarcane juice tends to be worse, reducing sugar increases significantly. (10)
3. Brix value : A brix value which is expressed as degrees brix ($^{\circ}\text{Bx}$), is the number of grams of sucrose present per 100 grams of liquid, which means %sucrose is equivalent to the brix value of sugarcane juice. It is usually near to 23% when the juice is fresh. (12)

Working of Ozone in Sterilization:

When oxygen from the oxygen cylinder is passed through the ozonator the O_2 is split into nascent oxygen. When this nascent oxygen reacts with the O_2 present in the sugarcane juice it forms O_3 i.e. ozone. (9) This ozone molecule attacks the microbes interacting and oxidising their cell walls leading to cell lysis. This oxygen further oxidises the other components like the nucleic acids, proteins and other components, thus destroying the cell of the microbe. (7)

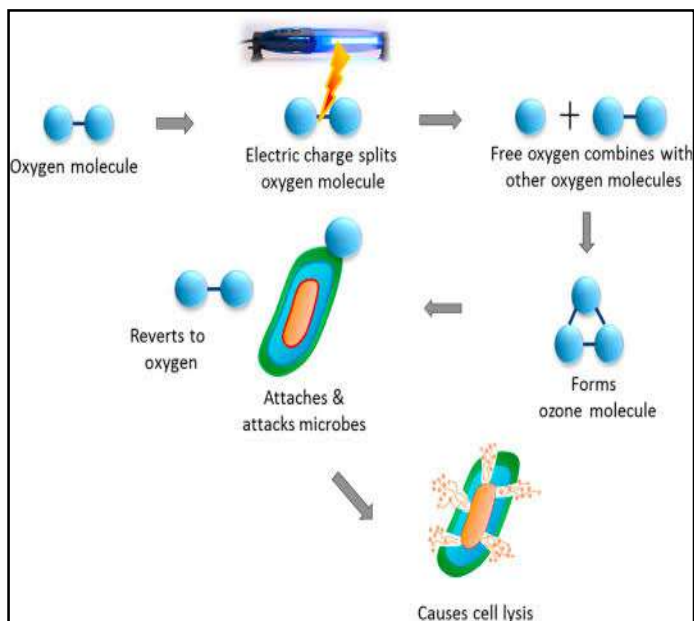


Fig 2: Mode of action of Ozone

Advantages of Ozone treatment over other sterilization methods:

Ozone having a much shorter half-life than other chemical disinfectants, and the only product left over from ozone disinfection is oxygen.(6)Hence it is a safer measure for disinfection as compared to other disinfectants including chloride, ethylene oxide, chlorine dioxide, isopropyl alcohol, phenolics, sodium hypochlorite, and iodophors. (2) Food industry using sugarcane juice aims at removal of colour strains and odours more effectively and destroy all forms of microorganisms at relatively low concentrations, ozone serves the need. (16)Studies have shown a tremendous reduction of microbial load i.e. more than 5-log reduction in pathogenic microorganisms which is achieved in fruit juices using ozone. (5) Ozone is known to destroy unsaturated bonds, forming aldehydes, ketones, or carbonyl compounds. It can break down cell membrane or protoplasm, inhibiting cellular reactivation of bacteria, coli forms, viruses, and protozoa which will help in regrowth of these organisms. (4)Currently the most widely used method thermal sterilization of sugar beet juices, but it has disadvantages. It is excess energy consuming and requires special equipment operating at high pressures. Ozone sterilization can be carried out in a less expensive flow apparatus with an ozone generator producing the gas from easily accessible oxygen. (1)Thus, use of such technology on an industrial scale would require many more studies to determine the efficiency of using ozone as a measure to sterilize media against the most common bacterial strains infecting fermentation worts and further contamination of fermentation medium.



Ozonation in increasing shelf life of food including sugarcane juice:

Extending shelf life of food products is a major aim of the producers, and the food industry requires 'green' alternative to the current methods. Ozone-based food preservation may be suitable for this niche. Ozone is an attractive alternative preservative which has properties like quick decomposition and little residual effect during food preservation that food industry needs due to its properties such as. Ozone is the strongest molecule available for the disinfection of water and other food products and is second to the only elemental fluorine in oxidizing power. Ozone is being used in the food industry for many applications such as reduction of microbes in water and the material equipments used and the working surfaces. Several studies focus on the use of ozone to deactivate microorganisms on fresh products, like fruits, vegetables, meat, poultry, fish, and eggs, and dry produce, such as cereals, pulses, and spices. (4)

Ozonation in Sugar and Jaggery production:

The clarification process of sugarcane juice has been the subject of several studies because sulphodefecation or sulphitation is the current process used to obtain white crystal sugar. Studies reported that sulphitation was the major process to clarify sugarcane juice to produce white crystal sugar, and currently it is still the traditional method of clarification. Sulphitation consists of the addition of gaseous sulfur dioxide (SO₂) to pre-heated (60°C) mixed juice until the pH value reaches between 3.8 and 4.2 (approximately 150 to 300g of sulfur per ton of sugarcane) and later alkalization with lime to gain pH 7.0-7.2. The sulphitation clarification method used is considered harmful to the environment and to humans because of the toxicity of sulfur and its derivatives. Many research works reported that deficiency of enzyme sulfite oxidase which is naturally present in humans, may be related to adverse reactions caused by sulphiting agents in sulfitation process of clarification. Patients of Asthama can be induced to have bronchospasm if they ingest food with sulfite. The Food and Agriculture Organization of United Nations (FAO) and World Health Organization (WHO), accepts a maximum of 15 milligrams of SO₂ per kilogram of white sugar for direct consumption, but there are international steps taken in order to reduce this limit too. (15) Therefore, because of the problems that are caused by the use of sulphiting agents as food additives to human health, alternative methods need to be used to preserve the food and beverage industry in order to minimize these effects. Ozone is used in treatment of drinking water, disinfection, odor and algae removal and also in degradation of organic pollutants. (4)

Ozonation in Fermentation of sugarcane juice for bioethanol production:

One of the main factors that affect the production of ethanol from raw sugarcane juice is it is microbially unstable and the possibility is that particular strains of bacteria, yeast and mold may cause infection. Before fermentation of any medium it is required to sterilize the medium to avoid further contamination during the fermentation process. (8) It is also important to demonstrate that ozonation does not generate fermentation inhibitors which would make the process of products of fermentation less efficient. In some cases ozonation is used to clarify the product obtained from the fermentation process. Bioethanol is obtained usually by three types of fermentation which include batch, fed-batch, or continuous. In batch fermentation, feed stock is added to the



fermenter along with microorganism, nutrients, and other ingredients at the beginning of fermentation of whole batch followed by recovery of ethanol, while, in fed-batch mode, one or more ingredients are added to the fermenter as fermentation is going on. Continuous fermentation involves a constant input of ingredients and removal of product from the fermenter. The selection of most suitable mode of fermentation mainly depends on the kinetics of the microorganisms used and the nature of feed stocks. Batch fermentation is the simple fermentation process due to low cost, less control requirement, easier sterilization, and management of feed stocks as well as employment of unskilled workforce.(14) Besides, most of the ethanol production study from juice feed stocks was carried out by batch fermentation. Fed-batch mode is widely employed in industrial production due to many compiling benefits from both batch and continuous processes. This mode of fermentation gives some benefits over conventional batch process such as maintenance of maximum total viable cell concentration, increased lifespan of cell, higher product accumulation, less inhibitory effect of higher substrate concentration, and control of several important factors such as pH, temperature, and dissolved oxygen at a specific level through the feedback activities. Continuous fermentation is carried out in mainly two basic types of reactors; for example, plug flow reactor and continuous stirred tank reactor because they offer some advantages over batch fermentation.(16) This mode of fermentation needs less downtime for vessel cleaning and filling giving increased productivity with lower cost. Free cells of suitable microorganism are normally used in fermentation that carry out their metabolic function in the fermentation broth producing ethanol from sugars. (16) Although, use of immobilized microbial cells on different carriers instead of free cells in fermentation is extensively studied to improve the process which showed some technical and commercial benefits over cell free system due to changes in growth condition, physiological and morphological properties, and catalytic activity of cells . This technique enhances the productivity as well as ethanol yield and minimizes the inhibitory effect of high substrate concentration and product . In addition, immobilization prevents cells from washing out in continuous fermentation that avoids separation or recycle and reuse of cells in the process. (14) Several carriers have been reported for cell immobilization including apple pieces, k-carrageenan gel, polyacrylamide, g-alumina, chrysotile, calcium alginate, sugarcane pieces, banana leaf sheath, and orange peel. Immobilization of yeast *S. cerevisiae* can be conveniently carried out by the cells that are enriched from culture media and grown at the log phase of growth followed by entrapping into the carriers like gels, etc.(13) It was reported that *Z. mobilis* in an immobilized cell bioreactor can produce increased ethanol during fermentation while having the capability of tolerating high concentration of sugars. Economic evaluation of fuel bioethanol production explores that more energy is consumed in recovery steps conducted by distillation due to low ethanol concentration in fermented broth. Therefore, increasing the content of ethanol in the broth can considerably reduce energy consumption in distillation. Very high gravity (VHG) fermentation is a method of using high concentration of sugars during fermentation with the output of increased concentration of ethanol.(16) This is a method employed in fermentation of the processed feed stocks containing 270 g/L or more dissolved solids, that is, free sugars. This technology exploits the enhanced and prolonged growth of



microorganism in the presence of low level of oxygen and reduces water consumption, labor cost, and distillation cost with more alcohol production. Although ethanol may be produced by yeasts, it is a toxic metabolite compound on yeast cells that may lead to cell lysis and death under this VHG environment with a limited ethanol concentration in the broth. Hence, viability loss of cells should be recorded and calculated during fermentation using methylene blue stain technique or colony forming units (CFU) method.(15) (16)

Conclusion:

Studies concluded that the application of ozone in clarification of sugarcane juice is a viable alternative, since values of reducing sugars and sucrose were not changed significantly, while the decrease of colour was significantly changed. However, it is important to determine the better way to obtain this technology in the clarification process because the heat treatment applied during pasteurization has great influence in juice color, Brix, reducing sugars, %sucrose and pol content of sugarcane juice. This behaviour can affect the best use of ozone as a clarifying agent as seen in many other treatment methods which include pre-heating sugarcane juice during pasteurization for the clarification process. Ozone is a safe disinfectant when used under controlled conditions. Ozone quickly decomposes to oxygen with little residual effect and hence its effects are short-lived and it is suited for use in preservation of most food materials. Some combination application of ozonation with pasteurization, UV, high-pressure processing, membrane processing and freezing may be very effective in microbial inhibition and shelf life extension and of food products. Ozonation showed to be an effective method of stabilizing fermentation media based on raw sugar beet juice, allowing for sterilization without inhibiting yeast cell growth. In samples which were sterilized using ozone, it was noted a significant increase in efficiency of process in comparison to fermentations conducted in media that were not sterilized, especially in worts with higher microbial contamination. An additional advantage may be observed if ozonation and fermentation in the same fermenter is performed or of treating fermentation media with ozone in a system of flow, as the fermentation tank is being filled. Use of ozonation for the stabilization of fermentation media based on sugar beet juices has been described in some studies.

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NEGOTIATION SKILLS OF WOMEN EXECUTIVES: A STUDY

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Abstract

Negotiation is an essential skill for managers in today's workforce. Having good negotiation skills can be the difference between success and failure in the Business world. Those that know how to negotiate tend to rise to the top of whatever industry they are in. At the same time, those that do not know how to negotiate tend to stay where they are or fall backwards.

Key Words: Negotiation, Business World, Workforce, Industry.

Introduction

Negotiation is simply the process of a discussion to reach some sort of agreement, especially as it relates to matters of business or state; negotiation skills are the skills most apt or efficacious in reaching the agreement you desire (or your company or organization), rather than the opposition.

In fact, strength and force could be considered a negotiation skill. Many times when there is a hostile take-over in the business world, the company or corporation with superior leverage, more market shares, greater cash flow, etc., can negotiate a better bargain in the company buy-out due to a stronger financial base. However, in real life, an equitable negotiation may in fact be more of a compromise. There are such things as business ethics. Unfortunately, if one side in the negotiation determines that they will never again do any business with a particular company or organization, they may indeed “play hardball”, which is certainly a legitimate negotiation skill.

Successful negotiation involves a series of tradeoffs and exchanging acceptable alternatives. It implies building relationships with those you are negotiating with. A manager has to look forward to a “win-win” result, so that all parties are positive at the outcome; you got what you wanted, I got what I wanted, we are both happy and satisfied.

Phases of Negotiation:

The expert negotiator does not have to hypnotize or swindle the opposition. However, such an individual will have superior negotiation skills such that they consistently get the best possible deal, all the time, even under less-than-ideal circumstances. It can be theorized that successful negotiators follow a four step process of:

- Preparation
- Information Exchange
- Explicit Bargaining
- Commitment



There is a pre-bargaining phase, bargaining phase, and closure phase. Understanding each of these phases is critical to successful negotiation and implementing the different negotiation skills required. There are many different negotiation skill sets that can be developed; lines of communication, listening carefully, attitude, cooperation, planning, goals, concession, mediation, and so on. Finally, a negotiation should lead towards a mutually acceptable compromise where both sides get as much as they want.

Objectives

1. To study the need and importance negotiation skills for women executives.
2. To study the nature of negotiation skills possessed by women executives in different sectors.
3. To study the role of negotiation skills in effective management of organisations.
4. To study whether women executives in different economic sector possess similar communication skills.

Methodology

The present study has been conducted in four districts of western Maharashtra viz. Satara, Sangli, Kolhapur and Pune. The study is purely based on primary data collected from women executives working in the five sectors viz. Education, Banking, Insurance, Medical and Manufacturing Industry. The primary data is collected through a structured questionnaire and observation method. For the present study 300 women executives from different sectors were interviewed and were also asked to fill up the questionnaire.

Selection of Sample Size

Different sources were used for getting the population of women executives working in the Education, Banking, Insurance, Medical and Manufacturing Industry. From the education sector, the Principals of Colleges and the Administrative officers in the Universities were selected.

In the Banking sector, Bank Managers were selected from selected banks viz. The Karad Urban Cooperative Bank Ltd., State Bank of India, Bank of Maharashtra, Bank of India, and Saraswat Bank.

In the insurance sector L.I.C Branch Managers and Officers were selected. In the Medical sector, Doctors were selected and in the industry sector, women managers and CEOs of manufacturing industries were selected.

Where the number of women is less than 50, 20% of the women were considered for the study. In case where there are more than 100 women in a particular area, 10% of the women are taken as sample size. However, in some cases where information was available, higher percentages of women were selected.

The selection was done on the basis of Cluster and Purposive sampling technique. The sample size was decided on a percentage basis of the universe.

Hypothesis: Negotiation skills of women executives are dependent of different sectors.

Tools of Analysis

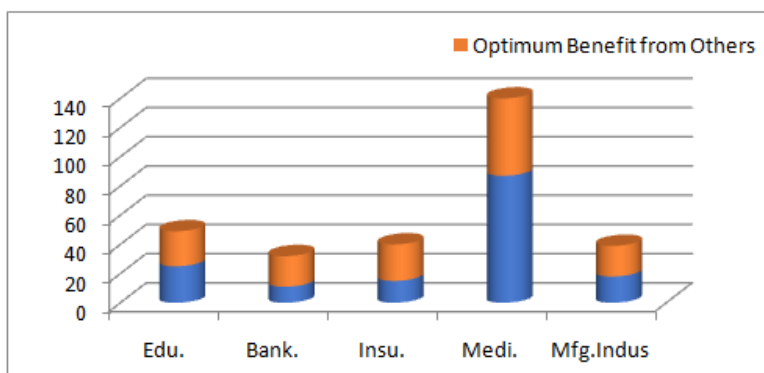
The collected data is analysed with the help appropriate statistical tools such as, percentages, bar diagrams and chi square test.

Table No. 1 **Negotiation Skills of Women Executives**

District	Basis	Edu.	Bank.	Insu.	Medi.	Mfg. Indus.	Total	%
Satara	Maximum Benefits from Others	5	1	1	13	2	22	42.31
	Optimum Benefit from Others	7	4	8	5	6	30	57.69
	Total	12	5	9	18	8	52	100.00
Sangli	Maximum Benefits from Others	6	1	5	4	1	17	38.64
	Optimum Benefit from Others	8	4	1	8	6	27	61.36
	Total	14	5	6	12	7	44	100.00
Pune	Maximum Benefits from Others	8	3	6	59	10	86	56.95
	Optimum Benefit from Others	4	12	11	33	5	65	43.05
	Total	12	15	17	92	15	151	100.00
Kolhapur	Maximum Benefits from Others	6	6	3	11	5	31	58.49
	Optimum Benefit from Others	5	1	5	7	4	22	41.51
	Total	11	7	8	18	9	53	100.00
Total	Maximum Benefits from Others	25	11	15	87	18	156	52.00
	Percentage %	8.33	3.67	5.00	29.00	6.00	52.00	
	Optimum Benefit from Others	24	21	25	53	21	144	48.00
	Percentage %	8.00	7.00	8.33	17.67	7.00	48.00	
	Grand Total	49	32	40	140	39	300	100.00
	Percentage	16.33	10.67	13.33	46.67	13.00	100.00	

Source: Primary Data

GRAPH NO: 1



Results and Discussions:

Hypothesis Testing

Table No.4.2.14 table shows that majority of the respondents (52%) try to derive maximum benefit out of which, 8.33% are from Education sector, 3.67% from Banking sector, 5% from Insurance sector, 29% from Medical sector, and 6% are from Manufacturing Industry. A large percentage of them (48%) try to derive optimum benefit from others while negotiating, out of which 8% are from Education sector, 7% from Banking sector, 8.33% from Insurance sector, 17.67% from Medical sector and 7% are from Manufacturing Industry.

It is observed that the percentage of respondents who get maximum benefits from others is higher than the ones who get optimum benefits from others in Pune and Kolhapur district. A reverse scenario is seen in Satara and Sangli district. In Banking, Insurance, and Manufacturing Industry, the percentage of respondents who get optimum benefits in negotiations is higher than the ones who get maximum benefits. In the Education and Medical sectors, a reverse scenario is seen.

Statistical Interpretation:

Ho: Negotiation skills of women executives are independent of different sectors.

H1: Negotiation skills of women executives are dependent of different sectors.

Satara District : Chi-square = 12.191; degree of freedom = 3; P = 0.016

Sangli District : Chi-square = 7.787; degree of freedom = 3; P = 0.100

Pune District : Chi-square = 14.580; degree of freedom = 4; P = 0.006

Kolhapur District : Chi-square = 3.742; degree of freedom = 3; P = 0.442

Total for 4 Districts: Chi-square = 13.675; degree of freedom = 4; P = 0.008

Ho is rejected and H1 is accepted. Hence negotiation skills of women executives are dependent of different sectors. They are mainly dependent in Satara and Pune districts.

Conclusion:

All the women executives are good negotiators. Majority of them try to get maximum benefits for their organisation through their negotiation skills. Negotiation skills are also useful in resolving various conflicts in the work place.

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A STUDY ON LEVEL OF AWARENESS OF SECONDARY SCHOOL TEACHERS IN RELATION TO RUBRICS

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ABSTRACT

In this study, the secondary school teachers' awareness towards rubrics was investigated with reference to gender and area of different discipline. In order to meet the descriptive survey method, 1000 government and government sponsored secondary school teachers related to the subjects like Language, Social Science, Science and Mathematics were considered through random sampling. Collected data through online mode was calculated and analysed by using Frequencies, Percentage, *t* test and *F* test. The results of this study revealed relatively very poor level of awareness and no significant difference was observed between female and male teachers belonged to government or government sponsored secondary schools towards the level of awareness on rubrics. Significant difference was also not found among the secondary school teachers belonged to different discipline in relation to rubrics.

Keywords: Area of Discipline, Awareness, Rubrics, Secondary School Teacher.

INTRODUCTION

Education is considered as an asset for the development of human resources in terms of skills, and knowledge that can be established by lend a hand of teacher. In educational organization teachers are acknowledged as fulcrum of educational reform. This reform not only flourishes within the students learning rather teachers and their progress regarding teaching learning methodologies. In order to be acquainted with the accountability of teachers towards teaching strategies for their student's learning, student's performance must be considered as teacher's assessment which plays massive tasks in teaching learning process. It not only helps out teachers but also students to transform in teaching and learning situation. Therefore, in modern education system students need to know not only the knowledge and skills but also require new learning objectives concerning with critical thinking, analysing, and inference as well as decision about the motive of assessment. In this regards Rabai (2014) explained that assessment was considered as a fundamental activity in teaching and learning process. It is moreover recognized as the integral part of teaching learning process as it determines the grades, positions, placement, progression, advancement, curriculum, syllabus as well as funding.

In teaching-learning process, assessment is considered as an integral part which provides benefit to both the learners and teachers along with the educational system by giving realistic view. The National Curriculum Framework (2005) has stressed that



assessment is associated with examination, stress and anxiety' and these can be eradicated by the help of bendy and innovative evaluation or appraisal procedure. In order to know the improvement, understanding, student's own strengths and weaknesses, self and peer appraisal, teacher's feedback, and formal evaluation can be taken into consideration. Therefore, the best shift of traditional assessment towards innovative and authentic assessment of teachers and students' learning is rubric.

In the field of assessment, the term rubric has been used for more than two decades. A rubric defines in writing what is expected of the student to get a particular grade on an assignment. It is one of the imperative assessment tools which provide remarkable reaction regarding student learning. Generally, rubric is considered as a set of instructions or rules. In a broad-spectrum, rubrics are multidimensional sets of scoring guidelines as well as rating scale which can be used to give consistency, reliability, stability and strength in evaluating student work. Rubrics are also considered as vehicles to interpret achievements into assessment terms. According to Donlan (2014) assignments in school are given with a guide that states the teacher's expectations and intentions. This guide is also called a rubric which helps the learners by illuminating opportunity, providing scope for self assessment as well as feedback to progress meant for upcoming assignments. It is not only useful for the grading criteria of teachers it is also helpful for learners as well. Rubrics not only furnish a common platform for the teachers rather it also offers sound communication for both the students and parents.

RATIONALE OF THE STUDY

In teaching profession teachers' empowerment and goals not only depend upon their content competency rather integral proficiency which includes planning, implementation, evaluation and revision. Reddy, and Andrade (2010) suggested in their research that rubric helped as guide and instructors to address ongoing course improvements about areas where the course needed improvement. The rubric-based self-assessment was found to be worth investing a student's time; while the teacher's oral feedback required time from both the student and teacher (Barney et al., 2012; Ritchie, 2016). The critical thinking awareness on assessment of learners can be increased only when their peers used rubrics provided by the teacher, similarly the knowledge and awareness on rubrics not only helped the teachers by making the grading process faster and consistent rather it additionally benefited parents by including them in their awareness of a grade and to show what to work on with their child (Donlan, 2014; Lynch, McNamara, & Seery, 2012). Subsequently, finding of Jeong (2015) showed the importance of rating experience for teacher raters and training as well as how to use rubrics and it was not possible without regular training for classroom teachers along with this, and the study also revealed that rubrics created transparency in classroom assessment. Rubrics are also beneficial to the learners in terms of promoting their critical thinking awareness along with advantages as well as weaknesses of peers. It not only focused on specificity, evaluative criteria, quality levels, quality definitions, quality processes, and presentation but also involved in 14 different areas in the field of education, these included scoring strategy, evaluative criteria, judgment complexity,



specificity, accompanying feedback information, secrecy, exemplars, quality levels, quality definitions, quality processes, users and uses, creators, presentation, and explanation (Dawson, 2017; Wang, Hwang, Liang, & Wang, 2017). Conversely, Brookhart (2018) found in her study that rubrics were one way to make learning expectations explicit for learners and it was only achievable by the assist of teachers. It was also exposed that after knowing about rubrics, learners become more accountable towards their own writing, greater sense of autonomy, ownership for their learning, aware of for their own learning goals and absolute control of their learning at all places achieving goals efficiently and effectively due to teachers' awareness toward the use of rubric. (Pandey, & Sharma, 2020; Sharma, 2019; Zhang et al., 2019). In addition to these Su (2020) revealed that rubric training improved students understanding and learning of interpreting skills, forming a favorable cycle of assessment-awareness-acquisition.

Therefore, in order to meet the purpose of improved instruction on rubrics, teachers must have knowledge, conception, awareness and skills on it to support learner success. After going through the assorted review of related literature, extremely atypical effort had been made to conduct a study on awareness of secondary school teachers about rubrics in the context of West Bengal. Hence, the present study was an attempt to expose the level of awareness of secondary school teachers in relation to rubrics.

STATEMENT OF THE PROBLEM

The present study was stated as

“A study on level of awareness of secondary school teachers in relation to rubrics”.

OBJECTIVES OF THE STUDY

The objectives of the present study were as follows:

1. To study the level of awareness of secondary school teachers with regard to rubrics.
2. To compare the level of awareness of female and male secondary school teachers in relation to rubrics.
3. To compare the level of awareness of secondary school teachers belong to different discipline in relation to rubrics.

HYPOTHESES

The researcher had formulated following hypotheses:

1. There would have significance level of awareness of secondary school teachers in relation to rubrics.
2. Significance of the difference between female and male secondary school teachers would not be there towards the level of awareness on rubrics.
3. No such significance of difference would be observed in the level of awareness of secondary school teachers belong to different discipline in relation to rubrics.

METHODOLOGY OF THE STUDY

Design

In this study, investigator had used descriptive survey method.



Sample

In order to accomplish this study, 1000 Government and Government Sponsored Secondary school teachers, who were belonging to the different districts of West Bengal, selected randomly. In this regard, 250 teachers from each area of subjects such as Language, Social Science, Science and Mathematics were taken into consideration to compose the sample size.

Tool

For collection of data self made online awareness test was used related to rubrics. It comprised 20 multiple choice items with four responses which were standardized by using content validity and test-retest reliability co-efficient (0.81) along with split half reliability co-efficient (0.84). Herein 20 items, one mark was considered as correct response and zero for wrong response. The teachers' level of awareness on rubrics was calculated by means of five categories of scores such as 1-4 very poor, 5-8 poor, 9-12 average, 13-16 good and 17-20 very good.

Procedure of Data Collection

In this study, the data was collected during lockdown of deadly pandemic for COVID-19. To administer the tool, was sent randomly to the secondary school teachers across the different districts of West Bengal through their Email and WhatsApp Messenger. Prior to sending, the teachers were well informed by the researcher about the tool and possible time schedule for submission through online in terms of email and WhatsApp Messenger. After receiving 250 responses of teachers from each area of four specialized subjects, no more responses were acknowledged to confine 1000.

Statistical Techniques

The responses of the teachers were computed and analysed through the application of obligatory statistical techniques such as frequencies, percentage, mean, standard deviation, t test and F test.

Delimitations of the study

The study was delimited to 1000 secondary school teachers from government and government sponsored schools across the different districts of West Bengal in which only four areas of specialized subjects were considered such as Language, Social Science, Science and Mathematics.

ANALYSIS AND INTERPRETATION

Hypothesis 1

To analyze the formulated hypothesis, gain scores of secondary school teachers were calculated, that had been used to establish frequency and percentage as well.

Table 1: *Frequency and Percentage of gain scores on the level of awareness of secondary school teachers with regard to rubrics.*

Sl. No.	Level of awareness on Rubrics	Frequency	Percentage (%)
1.	Very Poor	906	90.6
2.	Poor	67	6.7
3.	Average	14	1.4
4.	Good	8	0.8
5.	Very Good	5	0.5
	Total	1000	100

The result of the table 1 shows that major numbers of secondary school teachers have very poor level of awareness on rubrics. The table values clearly specifying that 96.6% of secondary school teachers have very poor level of awareness on rubrics, and poor level of awareness is found within 6.7% of teachers. Conversely very less i.e. 1.4% of teachers have average level of awareness on rubrics whereas, extremely negligible i.e. 0.8 and 0.5 percentages of secondary school teachers have good and very good level of awareness on rubrics correspondingly. Hence, it is clear that there is insignificance level of awareness on rubrics by the secondary school teachers.

Hypothesis 2

The gain scores on awareness of all female and male secondary teachers in relation to rubrics had been calculated to analyse the formulated hypothesis.

Table 2: *Mean, Standard Deviation, Standard Error of the Mean, Number of female and male school teachers, Standard Error of the Difference, Degrees of Freedom, and t value of gain scores on awareness of female and male secondary school teachers in relation to rubrics.*

Male Teachers				Female Teachers						
M_1	SD_1	SE_{M1}	N_1	M_2	SD_2	SE_{M2}	N_2	SE_D	df	t value
2.78	2.50	0.11	519	2.51	2.09	0.10	481	0.146	998	1.82

As shown in Table 2, the difference between mean gain scores of male and female teachers is negligible. Subsequently it is also observed that the computed t value 1.82 from the mean scores with 998 degrees of freedom is lower than the critical table value 1.96 at 0.05 level.

Therefore, it is obvious that the difference is insignificant at 95% level of confidence. Hence, it can be concluded that significant difference between female and male secondary school teachers is not there towards the level of awareness on rubrics.



Hypothesis 3

In order to analyse the gain scores of divergence level of awareness among the secondary school teachers belong to different discipline in relation to rubrics were calculated by using one way analysis of variance (ANOVA).

Table 3: *Sum of Squares, Degrees of Freedom, Mean Square Variance and F value of secondary school teachers' awareness scores towards rubrics according to different discipline.*

Source of Variation	SS	df	MS	F value	p value
Between Groups	15.384	3	5.128	0.95	0.41
Within Groups	5342.712	996	5.3642		
Corrected Total	5358.096	999			

The results given in table 3 shows that the computed F value 0.95, from the given mean square variance with degrees of freedom of between and within groups 3 and 996 respectively is lower than the critical table value 8.53 at 0.05 level as well as 26.12 at 0.01 level. The data also indicates that the p -value 0.41 is greater than the significance level of 0.05 and 0.01, consequently it can be accomplished that the difference is insignificant at 95% and 99% level of confidence [$F(3, 996) = 0.95, p = 0.41$] i.e. the result is not significant at $p < .05$ and .01. Hence, the null hypothesis is accepted and it is concluded that there is no significant difference in the level of awareness of secondary school teachers belong to different discipline in relation to rubrics.

MAJOR FINDINGS

- The government and government sponsored secondary school teachers who were belonging to the different districts of West Bengal had revealed 90.6% very poor, 6.7% poor, 1.4% average, 0.8% good, and 0.5% very good level of awareness on rubrics.
- The significant difference between female and male teachers belonged to government or government sponsored secondary schools was not there towards the level of awareness on rubrics.
- No significant difference had been also found out in the level of awareness of government or government sponsored secondary school teachers belonged to different discipline in relation to rubrics.

EDUCATIONAL IMPLICATIONS

- This study will focus on the barriers materialized by teachers in using rubric regarding teaching and learning situation.
- This study will also elucidate about the resolution and beneficiary site of using rubrics for teaching and assessment at secondary and higher secondary school level.



- Revolution in the curriculum of teacher education program with encouragement intended for various researches on rubrics can be established through this study.
- This study will make available coverage to the educational setting on quality teaching through the contemporary assessment and evaluation procedure in terms of rubrics.
- The study will moreover show the way to encourage the significance of rubrics through various workshops, seminars, symposium before the educationists as per the obligation.
- The education planner as well as policy maker can exploit the study nationwide to explore the existing status of rubrics.

CONCLUSION

In teaching profession teachers' empowerment not only depends upon their content competency rather integral proficiency which includes planning, implementation, evaluation and revision. In this study, it was established that utmost numbers of secondary school teachers hold very poor level of awareness on rubrics. In order to meet the sound judgment, fair and authentic assessment as well as informative feedback among the learners, teachers have to have appropriate knowledge, awareness and skills for utilizing rubrics to support learner success. Therefore, in this regards various workshops, seminars as well as seasonal courses are required to get quality teachers. In pre-service and in-service teacher training programme, rubrics techniques for assessment and evaluation can be infused among the teachers as a course of curriculum to shape the strength of awareness on rubrics.

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ROLE ON WATERSHED DEVELOPMENT PROGRAMMES IN INDIA – WITH SPECIAL REFERENCE TO TELANGANA STATE

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Abstract:

Watershed is not only the hydrological unit but it is also related with the socio-political-ecological factors which plays crucial role in determining food, social, and economical security and provides life support services to rural people of any country. The Watershed Development Programme (WDP) initially envisaged as a measure for poverty alleviation and improved livelihoods has gained even greater importance in light of the worldwide recognition of its effectiveness in combating climatic change. The criterion for selecting watershed size also depends on the objectives of the development and terrain slope. A large watershed can be managed in plain valley areas or where forest or pasture development is the main objective. In hilly areas or where intensive agriculture development is planned, the size of watershed relatively preferred is small. **Watersheds** have been implemented in **Telangana** through different programmes viz. Integrated Wastelands Development Programme, Drought Prone Areas Programme, Employment Assurance Scheme Programme and APRLP.

Keywords: Watershed, Watershed Management Approaches, Watershed Development Programmes, Telangana

Introduction

In India, most watershed projects are implemented with the twin objectives of soil and water conservation and enhancing the livelihoods of the rural poor (Sharma and Scott, 2005). Different types of treatment activities carried out in a watershed include soil and moisture conservation measures in agricultural lands (contour/ field bunding and summer ploughing), drainage line treatment measures (loose boulder check dam, minor check dam, major check dam, and retaining walls), water resource development/management (percolation pond, farm pond, and drip and sprinkler irrigation), crop demonstration, horticulture plantation and afforestation. The aim has been to ensure the availability of drinking water, fuel wood and fodder and raise income and employment for farmers and landless labourers through improvement in agricultural production and productivity. Today watershed development has become the main intervention for natural resource management. A total of 45.58 million hectares of land has been treated through various watershed development programmes in India with an investment of Rs 17,037 crore. The average expenditure per annum during the Tenth Plan is around Rs 2300 crore (Department of Land Resources, 2006). With programmes so large and varied, it is important to understand how well they function overall and



which aspects should be promoted and which be dropped. Keeping these issues in view, the present paper has examined the overall performance of watershed development programmes in the Telangana state.

The agriculture (rain-fed) contributes 58 per cent to world's food from 80 percent agriculture lands. As a result of global population increase, water for food production is becoming an increasingly scarce resource, and the situation is becoming worse because of climate change. The rain-fed areas are the centre of poverty, malnutrition, food insecurity, water security, severe land degradation, and poor social and institutional infrastructure. Watershed development program is, therefore, considered as an effective tool for dealing many of these problems and recognized as potential engine for agriculture growth and development in fragile and marginal rain-fed areas. Management of natural resources at watershed scale produces multiple benefits in terms of increasing food production, improving livelihoods, protecting environment, addressing gender and equity issues along with biodiversity. Effective use of land and water is fundamental to growth and sustainable development.

The concept of watershed management has evolved to ensure effective use of both natural and social capitals. Thus, the watershed development programmes include land, water and human resources as essential components. The watershed programme is primarily a land based programme, which is increasingly being focused on water, with its main objective being to enhance agricultural productivity through increased moisture conservation and protective irrigation for socio-economic development of rural people. It has been essential in a country like India where majority of the population depends on agriculture and about 60 percent of total arable land (142 million ha) in the country is rain-fed. A large portion of the rainfed areas in India is characterized by low productivity, high risk and uncertainty, low level of technological change and vulnerability to degradation of natural resources. Over the years, the sustainable use of land and water has received wider attention among policy makers, administrators, scientists and researchers. It is realized that sustainable development is synonymous to maintenance of productivity of natural resources and maintenance of ecological equilibrium. Emphasized the need for strengthening the three pillars of sustainable development, economy, society and the environment. The watershed forms an appropriate unit which links all these three components and has a direct bearing on human lives. The watershed approach is a system-based approach that facilitates the holistic development of agriculture, forestry and allied activities in the proposed watershed. It also forms an appropriate unit for analyzing the development-linked resource problems, designing the appropriate solutions of identified problems and eventually testing the efficacy of the measures taken up. Watershed Development Programmes (WDPs) have been accorded high priority in India's development plans. These programmes have been initiated in India to improve and sustain productivity and the production potential of the dry and semi arid regions of the country through the adoption of appropriate production and conservation techniques.

The WDP approach seeks to improve and develop all types of lands-government, forest, community and private lands- that fall within a particular watershed. It is a holistic approach to improve and develop the economic and natural resource base of dry and



semiarid regions. The programmes have stressed upon improvement of wasteland, runoff reduction, water conservation and protective irrigation mechanism in all areas including desert prone areas and drought prone areas. Development programs, envisaged under its purview include almost every activity which concerns land, water and biomass production. Experiences have shown that watershed as a base is very effective in use and management of land and water resources. With increasing awareness about the problems related to environment, use of watershed terminology is becoming popular and moreover in view of their potential for growth, improvement in income levels and augmenting the natural resource base of the disadvantaged regions of the country.

Environmental- For protecting vegetative cover for the whole year, to create ecological balance in the watershed area, protecting fertile top soil, utilizing the land based on its capabilities, in situ conservation of rain water, increasing ground water recharge.

Economic- It draws attention for increase in cropping intensity through inter and sequence cropping, maximizing farm income through agricultural related activities such as dairy, poultry, sheep and goat farming, improved and sustained livelihood status of the watershed community with special emphasis on the poor and women, etc.

Institutional-It includes formation of watershed committees and self-help- groups, establishing sustainable community organization, etc.

Social-It includes alleviation of poverty, awareness generation, improving skills of the local community, capacity building activities, women's participation in decision-making process, empowerment of the community, etc.

Equity-To develop equitable distribution of the benefits of land and water resources development and the consequent biomass production, involvement of village communities in participatory planning, implementation, social and environmental arrangement, maintenance of assets and to operate in a more socially inclusive manner.

WATERSHED DEVELOPMENT PROGRAM IN INDIA

About 60 per cent of total arable land (142 million ha) in India is rain-fed, characterized by low productivity, low income, low employment with high incidence of poverty and a bulk of fragile and marginal land. Rainfall pattern in these areas are highly variable both in terms of total amount and its distribution, which lead to moisture stress during critical stages of crop production and makes agriculture production vulnerable to pre and post production risk. Watershed development projects in the country has been sponsored and implemented by Government of India from early 1970s onwards. Various watershed development programs like Drought Prone Area Program (DPAP), Desert Development Program (DDP), River Valley Project (RVP), National Watershed Development Project for Rain-fed Areas (NWDPPA) and Integrated Wasteland Development Program (IWDP) were launched subsequently in various hydro-ecological regions, those were consistently being affected by water stress and draught like situations. Entire watershed development program was primarily focused on structural-driven compartmental approach of soil conservation and rainwater harvesting during 1980s and before. In spite of putting efforts for maintaining soil conservation practices (example, contour bunding, pits excavations etc.), farmers used to plough out these practices from their lands. The integrated watershed development program with participatory approach was emphasized



during mid 1980s and in early 1990s. This approach had focused on raising crop productivity and livelihood improvement in watersheds along with soil and water conservation measures. The Government of India appointed a committee in 1994 under the chairmanship of Prof. CH Hanumantha Rao. The committee thoroughly reviewed existing strategies of watershed program and strongly felt a need for moving away from the conventional approach of the government department to the bureaucratic planning without involving local communities. The new guideline was recommended in year 1995, which emphasized on collective action and community participation, including participation of primary stakeholders through community-based organizations, non-governmental organizations and Panchayati Raj Institutions (PRI).

Peoples Participation in Watershed Management

Like all other development programmes, watershed development also banks heavily on the participatory approach. Though, watershed development programme envisages an integrated and comprehensive plan of action for the rural areas, peoples' participation at all levels of its implementation is very important. It is so because the watershed management approach requires that every piece of land located in watershed be treated with appropriate soil and water conservation measures and used according to its physical capability. For this to happen, it is necessary that every farmer having land in the watershed accepts and implements the recommended watershed development plan. As the issue of sustainable natural resource management becomes more and more crucial, it has also become clear that sustainability closely linked to the participation of the communities who are living in close association with these natural resources. This requires sustained effort in two important areas: (i) to inform and educate the rural community, demonstrate to them the benefits of watershed development and that the project can be planned and implemented by the rural community with expert help from government and non-government sources, and (ii) to critically analyse the various institutional and policy aspects of watershed development programmes in relation to participatory watershed management.

Problems and Constraints in Watershed Management in Telangana

a) Land degradation in rain fed areas due to soil erosion from runoff is one of the major problems. In India it was estimated that the soil erosion in the 1990s was almost double that of soil erosion in the 1980s. Rainfall uncertainty and poor economic conditions act as a major constraint and thus prevents the farmers in rainfed areas from making investments. This leads to improper watershed management.

(b) Equitable benefit sharing of watershed management within the farming communities as well as within the different locations of watershed is a huge problem. Generally, women, marginal farmers and landless laborers gain very little or nothing at all from the watershed management activities. Several case studies in water scarce states of Gujarat and Madhya Pradesh, Telangana in India have showed that overdevelopment of water harvesting structures in the upstream portion of watersheds had significantly reduced the inflows into the downstream reservoirs. On the other hand, it is also noticed that building of large reservoirs resulted in the submergence and



hardship in the upstream parts and benefits for people in the downstream parts of the same watershed or a neighboring watershed generally having an urban or an industrial area.

(c) Acute shortage of water in general and drinking water especially in summer has been observed in many watersheds with inadequate watershed management which may result in severe/ recurrent droughts. It may often result in limited and temporary food productivity gains.

(d) Many a times, common lands do not get treated adequately and re-vegetation does not take place as expected in spite of the watershed management programs. As a result of this, domestic/ ecosystem water needs and livestock water/ fodder needs are either inadequately addressed or are made to suffer due to increased water withdrawals by other uses or due to overgrazing.

(e) Problems exist or new problems crop up due to improper understanding of the interaction between biophysical and socio-economic processes in watershed management.

(f) Conflict among various government ministries such as those related to agriculture [with emphasis on food production], rural development [with emphasis on employment generation & poverty alleviation], forests [with emphasis on maintaining biodiversity & wildlife], as well as conflict between government bureaucracy and elected representatives in their zeal to control funds, is a major problem in watershed management programs -which requires to be resolved on a priority basis.

(g) It is hard to conduct meaningful impact assessment studies on watershed management programs for lack of baseline data for monitoring and comparison of the current conditions. The whole exercise of watershed management is undertaken without properly estimating the water supply scenarios under drought/ normal/ surplus years as well as without proper demand management especially during drought years.

(h) Large areas inhabited with tribal population lack facilities to harvest water and to stabilize their food/ crop/ fodder production due to reduced forest yields, deterioration in land quality, lack of tribal agriculture policy and population pressure. This leads to a sustained misery, socio-political unrest and insurgency among the tribal population.

Conclusion

Today watershed development has become the main intervention for natural resource management and rural development. Watershed development programmes not only protect and conserve the environment, but also contribute to livelihood security. The importance of watershed development as a conservation programme is being recognized, not only for rainfed areas, but also for high rainfall areas, coastal regions,



and catchment areas of dams. With large investment of financial resources in the watershed programme, it is important that the programme becomes successful. Experiences show that the watershed development programmes have produced desired results and there are differences in their impacts. Hence, the watershed impact assessment should be accorded due importance in the future planning and development programmes. Watershed development activities have significant impact on groundwater recharge, access to groundwater and hence the expansion in irrigated area. Therefore, our policy focus must be on the development of these water-harvesting structures, particularly percolation ponds, wherever feasible. In addition to these public investments, private investments through construction of farm ponds may be encouraged as these structures help in a big way to harvest the available rainwater and hence groundwater recharge.

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OVERVIEW OF THE RIGHTS OF PERSONS WITH DISABILITIES ACT- 2016 WITH SPECIAL REFERENCE TO INCLUSION IN EDUCATION

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Abstract

Rights of Persons with Disabilities Act, 2016 also known as Divyangjan Adhikaar Kanon 2016 came into existence after a long wait. The draft bill for this act was offered in the parliament in 2011. It was enacted by the Rajya Sabha on 14th December 2016 and by the Lok Sabha on 17th December 2016. This act came into force on 30th December 2016. RPWD 2016 replaces the ages old 'Persons with Disabilities Act, 1995'. India has been in an immense requirement of such an act as there was no comprehensive act that could describe and implement rights of the persons with disabilities in the country. One of the most challenging issues in the global context is to provide free, compulsory education to all children irrespective of caste, creed, colour, religion and all social stratifications across the globe. Education is a basic human right and if "Right to Life" is a "Human Right Issue", then it is obvious that the persons denied or excluded from education surely denying that right, because without education, "Right to Life" has no meaning. Naturally, "Inclusion in Education" is also closely related to "Human Right Issue" (Mukhopadhyay, 2003). Inclusive education is an approach that implies the education for all children with or without special needs as an "integral part" of the general main-stream education system. This paper titled "Overview of The Rights of Persons with Disabilities Act- 2016 with special reference to Inclusion in Education" intends chiefly to explore various sections of the act and also the provisions for inclusion of all children of India in the RPWD Act, 2016. Further an effort is made to highlight the salient features of the act in general and chapter 3rd & 6th of the act has been focused in specific manner.

Key Words: Inclusion in Education, Disability, Children with special Needs and Rights of Persons with Disabilities.

Introduction

Rights of Persons with Disabilities Act, 2016 also known as *Divyangjan Adhikaar Kanon* came into existence after a long wait. The draft bill for this act was offered in the parliament in 2011. It was enacted by the Rajya Sabha on 14th December 2016 and by the Lok Sabha on 17th December 2016 and 'notified' by the Government in its official Gazette on 27th December 2016. The act consists of 17 chapters and 102 sections.



RPWD Act, 2016 replaces the ages old 'Persons with Disabilities Act, 1995'. It is a milestone in struggle for equal opportunities for disabled people in India.

India has been in a great need of such an act as there was no broadcast that could describe and implement rights of the persons with disabilities in the country. The act aims to provide equal opportunities to persons with disabilities and is definitely going to bring major positive changes in the lives of millions of people with disabilities in the country. The RPWD Act defines 21 categories of disabilities whereas the PWD Act 1995 included only seven disabilities. With increase in the number of disabilities the act increases the responsibility of agencies working in the disability sector.

Education is the most essential and crucial source of the development of an individual, society and nation. The development can be useful and sustainable only when it is comprehensive and inclusive. Inclusive word is adopted from inclusion literally it means "to include" or 'bring together'. It means bring all children together and collectively to educate them. According to census 2011, there are 21.8 million PWDs are in India and that makes the demand that our education system must be inclusive otherwise these 21.8 million PWDs will remain uneducated. That is why; the great need of inclusive education is recognized. Inclusive education includes every person of society. It starts primarily with accepting, understanding and attending the students with individual differences and diversity that may be physical, mental, social or emotional. Inclusive education focuses on the principles of maximum participation and use of maximum capabilities of disable persons and provides them the "least restricted environment". Inclusive education is defined as, "It allows all students equal access to the curriculum through differentiated, adopted and modified lessons to make them competent".

The RPWD Act and inclusive education both are working for welfare & upliftment of persons with disability, that's why they are inter related to each other. It means RPWD Act and inclusive education are helping hand for each other and interdependent on each other to achieve their desirable and decided aims and objectives. Inclusive education was in need of some legal provision to work more freely and sincerely for persons with disabilities and the RPWD Act played that role well. It magnanimously helps the inclusive education to achieve its determined goals more easily and swiftly. Inclusion is a philosophy which views diversity as strengths. A working definition of inclusive education was given by Sebba and Anisow (1996) in the following words: "An inclusive school works from the principle that all students in the community should learn together". The ideal system of inclusion is that the general education system itself should make education of special need children as its integral part. This implies that the general classroom teachers should be equipped with the skills to address the educational needs of children with special needs with minimum or no assistance from special teacher (Mani, 2002). The RPWD Act has given a new thrust to the inclusion of all children in the mainstream education, as without their inclusion the objective of universalization of education cannot be achieved.



Objectives and methodology of the study

The following objectives have been set in order to arrive at a conclusion of the study

- To give brief account of the Rights of Persons with Disabilities Act, 2016;
- To epitomize the concept of inclusive education;
- To explore the provisions of inclusive education in the RPWD Act, 2016;
- To suggest some pragmatic steps for implementing those provisions related to inclusive education.

The present study has been developed by an analysis of the qualitative data obtained from primary and secondary sources. These sources include reports, periodicals, news papers, thesis, dissertations, journals and other research studies. The primary source used in the development of the present study consisted mainly of the RPWD Act, 2016, official reports and publications of national and international organizations.

Need and rational of the study

It is believed that all human beings are creditable of equal rights without prejudice on the basis of caste, creed, colour, race, sex, nationality, capabilities and disabilities. Therefore, rights of persons with disabilities have happened to be acritical issue globally and substantial steps are being taken for the wellbeing and empowerment of persons with disabilities. The RPWD Act, 2016 is the most proficient act for encroachment and elevation of persons with disabilities. It generously helps the inclusive education to achieve its determined goals more easily and promptly. The purpose of writing this paper is to draw attention towards the role of the RPWD Act, 2016 in grass-root compensation in special reference with implication for inclusive education. Inclusive Education is the most appropriate approach to educate the persons with disabilities. This paper is reflecting different sections of the act which are purely dedicated towards inclusive education. This paper will definitely work as a helping tool for rehabilitation practitioners, teachers, special educators and all stakeholders who are working for the inclusion of persons with disabilities in the mainstream.

Rights of Persons with Disabilities Act, 2016: A brief account

Since 1981, after declaring the year as “The International Year of Disabled Person”, the persons with disabilities have made their organizations all over the world. These Organizations provide a voice of their own needs and priorities of rights. More recently, “The Convention on the Rights of Persons with Disabilities” of United Nations came into effect from May 2008 and signed by 160 countries of the world. The Conventions followed the principle of law tradition that all human rights are universal, individual, interdependent and interrelated. India signed and ratified the convention of U.N in 2007 and by then there was a great demand of more comprehensive legal provision for the rights of persons with disabilities. India ratified the proposal of the ‘Department of



Empowerment of Persons with Disabilities' and the act was made on 27th December 2016 under the title the "Rights of Persons with Disabilities Act, 2016". The Act consists of 17 chapters and 102 sections.

The act put forth new challenges before school education system which expects that the regular teachers & special educators to be equipped with more wide-ranging knowledge and skills required to cater special educational needs of students with a wider continuum of disability. The act is based on the postulation that disability is an essential part of human diversity; therefore the act is a powerful legal instrument to include PWDs in socio-cultural, economic and political life of the community by removing physical and attitudinal barriers. It shows our resolution to provide the most un-served, unseen and marginalized section of the society.

Salient Features of RPWD Act, 2016

The act has total seventeen chapters and one schedule. The following points highlight its salient features:

- The act endow with equal opportunity for all persons with disability and non-discrimination in their community, life security, safety, home, family, reproductive rights, access to voting, justice, legal facilities, guardianship and supports.
- The act endow on the education of all children with disability, women and adult. Education must be free up to 18 years and inclusive provision is structured and all required learning materials, aids, methods, experts etc. will be made available.
- The act gives prominence on the skill development and employment of persons with disability according to their individual capabilities and there will be no prejudice in employment.
- The act makes requirements of social security, health care, rehabilitation, recreation, insurance schemes, sporting activities, researches and developmental programmes for PWDs. The special provisions available in the act are as under:
 - ✓ **Free education up to eighteen (18) years,**
 - ✓ **Age relaxation of five (5) years,**
 - ✓ **Minimum 4% reservation in employment and promotion,**
 - ✓ **5% reservation in higher education,**
 - ✓ **5% reservation in allotment of housing land,**
 - ✓ **Agricultural land and poverty schemes etc.**
- The act stipulates duties and responsibilities of appropriate authorities like awareness campaigns, accessibility of disabled to every required means and facility. These authorities have to make arrangements of information, consumer goods, transports, safety measures, accessible infrastructure, research works, human resource development plans and social audit of all persons with disabilities.
- There is also a detail note on the registration of institutes of persons with disability, their maintenance, facilities and grants.
- The act gives detail explanation about the certificates of disabilities to people to provide them appropriate amenities.
- The act focuses the central and state advisory boards, district level committees, chief commissioner & state commissioner for persons with disabilities.



- It also provides information regarding special courts and their functions, duties and provisions.
- This act makes provision for the national and state funds for persons with disability.
- There is a feature of offences and punishments against persons with disabilities.
- The act also focuses the legal powers of rulemaking of central, state or local govt. for the welfare of persons with disabilities under the 17th chapter “miscellaneous”.
- The Schedule of the act describes the 21 types of disabilities as:
 - ✓ Blindness,
 - ✓ low-vision,
 - ✓ leprosy cured persons,
 - ✓ hearing, Impairment (deaf and hard of hearing),
 - ✓ Locomotor disability,
 - ✓ Dwarfism,
 - ✓ Intellectual disability,
 - ✓ Mental illness,
 - ✓ Autism spectrum disorders,
 - ✓ Cerebral palsy,
 - ✓ Muscular dystrophy,
 - ✓ Chronic Neurological conditions,
 - ✓ Specific Learning Disabilities,
 - ✓ Multiple sclerosis,
 - ✓ Speech and Language disability,
 - ✓ Thalassemia,
 - ✓ Hemophilia,
 - ✓ Sickle cell disease,
 - ✓ multiple disabilities including deaf-blindness,
 - ✓ Acid Attack victim and
 - ✓ Parkinson’s disease.
- **The 17 chapters included in the act are :**
 - ✓ Chapter I –Preliminary
 - ✓ Chapter II- Rights And Entitlements
 - ✓ Chapter III- Education
 - ✓ Chapter IV-Skill Development And Employment
 - ✓ Chapter V- Social Security, Health, Rehabilitation And Recreation
 - ✓ Chapter VI-Special Provisions For Persons With Benchmark Disabilities
 - ✓ Chapter VII-Special Provisions For Persons With Disabilities With High Support Needs
 - ✓ Chapter VIII- Duties And Responsibilities Of Appropriate Governments
 - ✓ Chapter IX- Registration Of Institutions For Persons With Disabilities And Grants To Such Institutions
 - ✓ Chapter X-Certification Of Specified Disabilities
 - ✓ Chapter XI- Central And State Advisory Boards On Disability And District Level Committee



- ✓ Chapter XII- Chief Commissioner And State Commissioner For Persons With Disabilities
- ✓ Chapter XIII- Special Court
- ✓ Chapter XIV- National Fund For Persons With Disabilities
- ✓ Chapter XV- State Fund For Persons With Disabilities
- ✓ Chapter XVI- Offences And Penalties
- ✓ Chapter XVII- Miscellaneous And
- ✓ One Schedule - Specified Disability

Conceptualizing Inclusive Education

Inclusive word is adopted from inclusion literally it means “to include” or 'bring together'. It means bring all children together and collectively to educate them. According to census 2011, there are 21.8 million PWDs are in India and that makes the demand that our education system must be inclusive otherwise these 21.8 million PWDs will remain uneducated. That is why; the great need of inclusive education is recognized. Inclusive education includes the every person of society. It starts primarily with accepting, understanding and attending the students with individual differences and diversity that may be physical, mental, social or emotional. Inclusive education focuses on the principles of maximum participation and use of maximum capabilities of disable persons and provides them the “least restricted environment”. Inclusive education is defined as, “It allows all students equal access to the curriculum through differentiated, adopted and modified lessons to make them competent”.

There are some beliefs, principles and features of inclusive education. Inclusive education believes that,

- ✓ Every child has fundamental right to education, and must be given the chance to realize and sustain an acceptable level of learning.
- ✓ Every child has sole characteristics, interests, abilities and learning needs.
- ✓ Every child can be enrolled in the neighboring schools.
- ✓ All children must be given suitable and individualized educational program.
- ✓ All children must be provided an appropriate curriculum to accomplish their needs.
- ✓ Every child should take part in co-curricular and extra-curricular activities.
- ✓ All children must be given benefits from co-operation & collaboration among friends, family, home, class-room, school and community.
- ✓ Least restricted environment must be provided to every child.
- ✓ Optimum capabilities of every child must be used.
- ✓ Every child has individual diversity in his personality and that's why individualized attention, facilities and help can develop his/her personality better.

It is noticed that inclusive education has come into origin with the origin of the organizations of persons with disabilities. Before that there was no need of inclusive education because people, society and nation were not much aware of education and rights of disable persons. The RPWD Act and Inclusive Education both are working for empowerment & upliftment of persons with disabilities. It reflects that RPWD Act and inclusive education are helping hand of each other and mutually dependent on each



other to achieve their desirable and determined aims and objectives. Inclusive education is in requirement of some legal provision to work more freely and genuinely for persons with disabilities and the RPWD Act played that role well. And the act was also in need of an agency to put into practice its provisions on grass-root level. Thus the both are complementary to each other.

Provisions in the RPWD Act, 2016 for inclusive education

Many provisions are made in RPWD Act, 2016 for children with disabilities which need consideration of regular teachers, special teacher and other professionals involved in the education of children with special need.

Section- 3 of the act directs authority to guarantee that persons with disabilities enjoy the right to equality, life with dignity and respect for his or her integrity equally with others”.

Section- 4(2) provides that Government and local authorities shall ensure that all children with disabilities shall have right on an equal basis to freely express their views on all matters affecting them and provide them appropriate support keeping in view their age and disability. It means the school is not only anticipated to take account of students with disabilities in the process of decision making affecting them such as decisions regarding their sitting arrangements, designing and execution of Individualized Educational Programmes (IEPs) etc.

Chapter-III of the act is dedicated to educational necessities for children with disabilities.

Section- 16 of the chapter provides that all the recognized educational institutions including private schools providing inclusive education to the children with disabilities should:

- ✓ Admit them without favoritism;
- ✓ Provide facilities for sports and leisure;
- ✓ Make building, campus and various amenities accessible;
- ✓ Provide support services to optimize their social and academic development;
- ✓ Make sure most proper languages, modes, and means of communication for the blind, deaf and deaf-blind children;
- ✓ Early identification and intervention for children with specific learning disabilities;
- ✓ Oversee involvement, progress and achievement levels of children with disabilities;
- ✓ Provide transportation services to the children with disabilities and also help to the children with disabilities having high support needs.

It has been observed that private schools resist in implementing RPWD Act with reference to the admission of children of weaker sections in their schools, similarly, they may not show a constructive approach towards the inclusion of children with disabilities in private schools for a variety of reasons.

Section- 17 prescribes the following measures to implement Section 16 of the act:

- ✓ To debar an investigation of school going children in every five years to recognize children with disabilities;
- ✓ To establish an adequate number of teacher training institutions;
- ✓ To guide professionals and staff to support inclusive education;
- ✓ To create an adequate number of resource center's to support inclusive education;



- ✓ To supply books, other learning resources and suitable assistive devices to students with disabilities;
- ✓ To give scholarships to students with disability; and
- ✓ To make suitable adaptations and modifications in the curriculum and examination system;

Section- 31 of the Act directs that every child with disability between the age of 6 to 18 years shall have the right and access to free education in a neighbourhood school, or in a special school, of his/her choice in an appropriate environment.

Section- 32 (1) provides 5% reservation to persons with disabilities in all the Government and Aided higher education institutions. Relaxation of five years in upper age limit for the purpose of admission has also been given in such institutions.

Section- 34 (1) provides 4% reservation in Government jobs to the persons with benchmark disabilities. These provisions are extremely useful to empower persons with disability through education and employment.

Section – 45(1) directs to develop all public building including schools accessible within a period of not exceeding 5 years of notification of rules for such purpose. A large number of schools in different parts of the country even lack basic facilities; therefore, due to scarce funds and other practical reasons, the states and local bodies may not find it possible to achieve the objective within the fixed time frame.

Suggestions for optimizing inclusiveness and strengthening implementation of the RPWD Act, 2016

- Teachers need to have at their disposal a deep fund of empathy, commitment, conviction and ability & motivation to persevere: knowledge and resources to respond and create meaningful educational experiences for all children.
- Seminars, workshops, conferences, orientation programmes should be organized for building awareness to all the stakeholders of education about the potentialities of the RPWD Act, 2016.
- To successfully implement the RPWD Act, Women and Child Development Ministry, Ministry of Social Justice and Empowerment, the Human Resource Development Ministry and Labour Ministry needs to work together with a common goal.
- Education as a right must apply to all citizens of India. State and central Governments as well as all the other social sectors should recognize the importance of inclusive education that addresses the varied needs of all learners.
- A policy of inclusion needs to be implemented in all schools and all schools need to become centers that train children for life and guarantee that all children, especially the CWSN, children from marginalized sections, and children in complicated situation get the utmost benefit of this critical area of education.
- Positive attitude of teachers towards inclusive education could be shaped and developed in the perspective of an educational system which can provide some specific environment in order to have a positive practice in the area of inclusion.



- Families having children with disabilities should build up associations with families having children without disabilities and be able to make a joint contribution to the society.
- In-service training programmes of two to three weeks' duration on how to deal with CWSN for teachers and special educators in all the disabilities and in specific areas of disability should be organized.
- Those schools that are committed to give admissions to children with special needs should organize orientation and sensitization programmes for their teachers about how to get adjusted with the CWSN and how to handle them.
- Intermittent assessment of the training programmes and regular updating to meet the challenges of new trends in inclusive education should be part of the planning of teacher training.
- Inclusion should not be the exclusive accountability and responsibility of the specific class teacher. Everybody should be concerned and take liability.
- The curriculum of the inclusive schools should be reformed and modified as per the needs of the children with disabilities and strictly adhere to the principles of inclusion.
- All schools giving admission to the CWSN should ensure that learning of each and every child should take place by making use of differentiated instructions if not possible through regular instructions.

Conclusion

The RPWD Act, 2016 is the most proficient act for encroachment and elevation of persons with disabilities. It generously helps the inclusive education to achieve its determined goals more easily and promptly. More studies need to be conducted to find out the effectiveness of RPWD Act, 2016 in our social and national context. Inclusive education is considered to be good only if it permits all the students to get involved in all aspects of classroom equally or close to equal. In order to make inclusion successful and to overcome the barriers, the contribution and cooperation of educators, parents, and community leaders is deadly required. The Government of India is continuously working upon its educational system and trying its level best to successfully implement inclusive education in letter and spirit by bringing new legislations. The barriers and challenges can be conquered by generating awareness of human rights in communities and by sharing success stories depicting role of inclusion in providing quality life to children and adults with disabilities. We need to build up an inclusive design of learning to make the education blissful and magnificent for all children so that the education in real sense becomes learner centered and advantageous. All learners irrespective of their disabilities feel as a part of it not apart from it. Therefore, Inclusion arose as an excellent resolution to the issue of how to include, involve and educate all these children in the regular schools more productively and successfully.



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ARTIFICIAL INTELLIGENCE: TRANSFORMING THE FACE OF INDIAN HEALTHCARE SECTOR IN POST COVID 19 ERA

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ABSTRACT

Today's health sector is changing very rapidly. New technologies, innovations and inventions are being made in the field of health sector. One such innovation is the application of Artificial Intelligence popularly known as AI in the healthcare sector. In computing, AI (AI), sometimes called machine intelligence, is intelligence demonstrated by machines, in contrast to the natural intelligence displayed by humans and animals. In the pre pandemic period of Covid 19 the use of AI in health sector of the India is limited to radiology, medicine development and researches. And also in the Covid 19 pandemic period too the use of Artificial Intelligence is very limited. To be clearly it was used in India by the state of Kerala, Maharashtra and AIIMS in New Delhi. By considering the threats posed by the Covid 19 there exists a wide scope for the implementation of AI in the present situation the country. It helps to avoid the direct contact of nurses and doctors with of the country are increasing which too increases the scope of AI. With proper funding and providing technical and financial assistance to the robotics industry by the Government makes a better growth in the economy and also such AI can be effectively implemented in the healthcare sector which changes the whole face of competitive in facing future pandemics if any.

Keywords: Artificial Intelligence, Covid 19, Indian healthcare sector, Post Covid 19 era

INTRODUCTION

Artificial intelligence (AI) in aid is that the employment of complicated algorithms and package to emulate human psychological feature inside the analysis, interpretation, and comprehension of difficult medical and aid knowledge.

Specifically, AI is that the power of pc algorithms to approximate conclusions while not direct human input.

What distinguishes AI technology from ancient technologies in health care is that the power to comprehend info, method it and provides a well-defined output to the end-user. AI will this through machine learning algorithms and deep learning. These algorithms will acknowledge patterns in behavior and build their own logic. So as to cut back the margin of error, AI algorithms ought to be tested repeatedly. AI algorithms behave otherwise from humans in 2 ways: (1) algorithms square measure literal: if you set a goal, the algorithmic rule cannot change itself and solely perceive what it has been told expressly, (2) and a few deep learning algorithms square measure black boxes; algorithms will predict very precise, however not the cause or the why.



The first aim of health-related AI applications is to analysis relationships between bar or treatment techniques and patient outcomes. AI programs square measure developed and applied to practices like designation processes, treatment protocol development, drug development, customized medication, and patient observance and care, to boot hospitals square measure trying to AI package to support operational initiatives that increase value saving, improve patient satisfaction, and satisfy their staffing and personnel wants. corporations square measure developing prophetic analytics solutions that facilitate aid managers improve business operations through increasing utilization, decreasing patient boarding, reducing length of keep and optimizing staffing levels.

OBJECTIVES

- 1) To investigate why the Artificial Intelligence is therefore necessary on health care sector throughout the Covid 19 period.
- 2) To investigate the scope of Artificial Intelligence in medical aid sector throughout the post Covid nineteen era.

RESEARCH METHODOLOGY

- The data are collected through secondary sources such as magazines, journals, newspapers, search engines, online journals.

RESULT & DISCUSSION

USE OF ARTIFICIAL INTELLIGENCE IN THE CURRENT COVID 19 ERA

Artificial intelligence (AI) and machine learning (ML) are witnessing increasing adoption within the Indian attention setting. With a surge in non-communicable diseases and additionally the increasing form of aging population inside the country, the burden of illness management has been increasing year-on-year and to manage that, the government , the eye professionals and then the eye institutions are trying to hunt out innovative ways that within which.

Studies have shown that deep learning algorithms have given higher insights to clinicians in predicting prognosis and future events in patients. Also, advanced digital technologies like AI and metric unit of measurement can facilitate in bar in addition as early detection of diseases by capturing and analyzing varied organ of patients. Artificial intelligence makes it realizable to access the employment and knowledge from many thousands of patient cases. One recent development is Microsoft – Phoebe Hospitals’ partnership to make an AI-focused network in medication. “We designed a partnership where they carry within the technology that we've got an inclination to start the knowledge , algorithms and then the clinical insights into what's impacting and additionally the tactic this could translate into favorite risk analysis then in differential pattern and methodologies,” same Sangita Reddy, Joint MD, Phoebe Hospitals. Armed with such targeted analytics, doctors could even be higher able to assess risk,



build correct diagnoses, and supply patients easier treatments, says Agus, the author of *The Lucky Years: the thanks to Thrive within the Brave New World of Health* and then the highest of health problem. He believes AI's potential to spice up health care is "staggering."

"We have many data that we've been assortment over decades," he says. "For the primary time, computing power permits U.S. to use the knowledge throughout a thanks to profit patients."

As the COVID-19 pandemic continues to unfold in Republic of India and across the planet, Kochi-based startup Isaac Asimov AI has developed a golem that is ready to be deployed in hospitals to ease pressure on the medical workers. The machine golem can carry food, medical and clinical consumables and navigate freely within the hospitals. The golem has been developed in fifteen days by a team of seven people. The golem is especially designed to be used inside isolation wards. The robot, dubbed "KARMI-BOT", has lower and better trays that is ready to be loaded with food or sterile containers. additionally, the golem in addition disinfects the used things as a results of it comes out of the quarantine zone. The golem in addition lets doctors or relatives move with the patients through video job. the golem has autonomous navigation and can be used remotely in addition. The advantage of deploying a golem throughout this case is to cut down on human to human contact. this could facilitate every doctors and guests. Earlier this month, Jayakrishnan and his team deployed two golem robots at the doorway of Maker Village at the Kinfra subtle Park in Kalamassery to make awareness regarding the coronavirus irruption and distribute masks and sanitisers to those who add the Integrated Startup sophisticated. to scale back constant exposure between covid-19 patients and caregivers, and intensify screening, hospitals in Republic of India are turning to robots of each kind. Delhi-based AIIMS hospital has deployed a floor disinfectant and a golem golem in covid-19 wards. Fortis Hospital, Bengaluru has in addition deployed AN interactive golem at its entrance to screen everyone, beside medical workers, entering into the premises. "We have seen a rise in demand for our robots coming back from hospitals across Republic of India. we've got an inclination to are already in talks with several hospitals beside Fortis, CloudNine and straightforward lay. Some hospitals have shown interest in but robots are typically leveraged within the highest of the day," same Rajeev Karwal, founder chairman, Milagrow, the Gurugram based AI company that created the robots deployed at AIIMS. According to UK-based data analytics firm, GlobalData, adoption of robots to treat covid-19 patients is anticipated to grow in Republic of India owing to shortage of PPE or personal protective instrumentation. A Jaipur-based hospital is in talks with AI companies to deploy a golem to deliver food and medicines to covid-19 patients in isolation wards.

The interactive golem golem deployed at AIIMS stands ninety 2 cm tall, has cameras and sensors to sight obstacles and may monitor and move with patients. The second golem deployed at AIIMS can alter floor surfaces victimization bleach answer. every robots can move autonomously and operate whereas not human intervention. The golem at Fortis uses face and speech recognition to boost queries and thermal



scanners to need temperature reading. Once it's screened and cleared a personal, it issues a pass to enter. simply just in case it detects higher temperature , it'll alert the doctors, and patient can consult a hospital doctor directly through the screen on the golem. Karwal points out, AIIMS required a golem which can forestall attention workers from going inside the covid-19 ward too repeatedly, as whenever a private goes in and comes out of the ward, they are alleged to modification the PPE.

Deploying robots to scale back human contact is being tried in several countries in addition the sphere hospital in Hongshan Sports Center, metropolis has deployed multiple robots for nearly everything from screening people once they enter hospitals to delivering food and medicines in isolation wards and fun patients. they are in addition obtaining accustomed spray disinfectants and clean hospital floors.

Robots are employed by hospitals in Republic of Republic of India before. for instance, it had been used inside the preciseness surgery performed by doctors at PGIMER Chandigarh on a two-year-old baby United Nations agency was born whereas not a food pipe. One recent development is Microsoft – Phoebus Hospitals’ partnership to make AN AI-focused network in medication. “We designed a partnership where they carry within the technology that we've got an inclination to start the knowledge , algorithms and then the clinical insights into what is impacting and therefore the manner this may translate into favorite risk grading then in differential pattern and methodologies,” aforementioned Sangita Reddy, Joint MD, Phoebus Hospitals.

“AI goes to assist United States in not solely distinguishing the vulnerable patients early however additionally in terms of modifying the intensity of treatment once classifying them into high risk or terribly high risk cluster,” aforementioned Dr (Prof) N.N Khanna, Senior adviser - Interventional medicine and vascular Interventions, Indraprastha Phoebus Hospitals.

However, the utilization has been restricted to a couple of hospitals and tasks. the continued crisis has created the globe grasp the importance of the many of the rising technologies like 3D printing, drones and robots.

SCOPE.OF ARTIFICIAL INTELLIGENCE IN HEALTHCARE SECTOR IN POST COVID 19 ERA

“Although robotic technology is currently expensive for wider adoption across all kinds of healthcare settings, it's expected to seek out increasing use in countries like India thanks to very less number of healthcare professionals available for quite 1.3 billion population,” Bhaskar Vittal, medical devices analyst at GlobalData said during a press statement.

“There may be a huge assistance from AI within the delivery of healthcare today. Now the physician features a complete picture of what might be the various diagnosis and you are trying to compute it from there,” said Dr Naresh Trehan, Chairman & Managing



Director, Medanta-The Medicity. He further added, “The power of AI also can be leveraged to assist newer physicians, who do not have much of experience to truly be ready to come to the right conclusions.” The fields where AI are often used should be extended or diversified in India. Because the work of AI is not limited to the field of radiology, medicine development and researches. In the rest part of the world the AI is used in different fields of health care sector. The fields in healthcare sector of India where AI can be used are as follows:

1. USE OF AI IN PATHOLOGY:

Artificial Intelligence can be used India by the Pathologists in making more accurate diagnosis of diseases. It can be used in the field of cancer treatment where the pathologists can reduce the error in cancer diagnosis and developing methods for individualized medical treatment facilities available to patients in Indian hospitals. One such machine learning technology named PATHAI have been used by the pathologists in US to diagnose diseases.

2. USE OF AI AS A SYMPTOM CHECKER:

In India hospitals can use symptom and cure checker technologies in hospitals with the use of AI. In this method the hospitals can use a chatbot which listens to the patient’s symptoms and health concerns and then guides that patient to the correct care based on its diagnosis. This will help to reduce the wastage of time of both doctors and patients. Harvard Medical School uses the this kind of intelligent symptom checker named Buoy’s AI to help diagnose and treat patients more quickly.

3. USING AI FOR ACTIONABLE INSIGHTS:

Hospitals in India can use deep learning medical tools to streamline radiology diagnoses. These deep learning platform analyses unstructured medical data(radiology images, blood tests, EKGs, genomics, patient medical history) to give doctors better insight into a patient’s real-time needs. It helps the doctors in providing better treatment to the patients as per their diseases.

Artificial Intelligence can be used in screenings, diagnostic tests and blood work to test for cancer. By deploying AI at general screenings, it aims to detect cancer in its earliest stages and subsequently develop new treatments.

4. HELPS TO DEADLY BLOOD DISEASES FASTER:

Hospitals can use Artificial Intelligence to diagnose potentially deadly blood diseases at a very early stage. Doctors can use AI-enhanced microscopes to scan for harmful bacterias (like E.coli and staphylococcus) in blood samples at a faster rate than is possible using manual scanning. These kind of machines can be used with extra deep learning technologies by using experienced scientists. And also makes that machines 95% accurate in identifying and predict harmful bacteria in blood.

5. HELPS TO DEVELOP MEDICINE FASTER:

Artificial Intelligence can be used to develop medicines as fast as possible for any disease of any risk level. Many biopharmaceutical companies can deploy this intelligence to develop efficient medicines.



6. AUTOMATING HEALTHCARE'S MOST REPETITIVE PROCESSES:

Artificial Intelligence can be used to automate the healthcare industry's most repetitive tasks, freeing up administrators to work on higher level ones.

7. HELPS IN REAL TIME OPTIMIZATION OF PATIENT FLOW:

AI helps in the real time patient flow optimization includes the process of solving operational challenges including those related to emergency rooms and patient safety. It helps to prioritize the patient's illness or injuries, track easiest ambulance routes and take appointment for the doctors quickly.

8. INCREASING ACCESS TO HEALTHCARE:

AI helps to provide personalized and interactive healthcare facilities to patients at anywhere at anytime including face-to-face appointments with doctors.

9. CREATES DATA LIBRARY FOR PERSONALISED HEALTHCARE:

With the help of AI clinical and molecular data of patients can be collected in order to provide personalized healthcare facilities to the patients.

10. HELPS IN HOSPITAL RISK PREDICTION:

AI can be used to predict clinical, financial and operational risk by taking data from available sources and foretells who might get sick to what's driving up a hospital's healthcare risk.

11. HELPS IN PREDICTING WHOLE HEALTHCARE SERVICES:

AI can be used to predict ICU transfers, improve clinical workflows and even pinpoint a patient's risk of hospital acquired infections.

12. HELPS IN CONDUCTING SURGERIES:

With the use of AI surgery can be performed in a new manner. Robots equipped with cameras, mechanical hands and surgical instruments perform the surgeries under the guidance of the concerned doctors if they are unavailable and also it gives the doctors a 3D, magnified image of the surgical sites.

13. HELPS IN PERFORMING HEART THERAPIES:

With the help of AI heart therapy can be performed. For this purpose small robots have to be developed to enter into the heart to identify the problems and to cure them.

All these show the scope of AI in Indian healthcare sector. There is a chance in many parts of the India to open hospitals especially multi speciality hospitals in different parts of the country. In such a situation the scope for AI is very high. Not only for new hospitals but for the existing hospitals too the administrative authorities both public and private can take decision regarding the same. For this the government can provide proper funding and technical assistance to the developers. In the newly building Kasaragod hospital building under the TATA Company the AI can be implemented more efficiently and accurately. For the implementation of AI the government have to provide necessary finance and encourage those industries and start ups focused in this area to flourish their business, after the lock down period there comes many start ups and industries mainly focusing on the robotics because now many industries had came up with this idea. India is a country where so many creative and innovative people lives so many makes the use of this scope of AI in the future India. In such a situation India is able to provide healthcare services like many other developed countries.



CONCLUSION

There lies an opportunity in every stress areas. Now the Covid 19 pandemic situation provides a better opportunity for the implementation of AI in the healthcare sector because now the every part of India is suffering from this deadly disease and many doctors, healthcare workers etc are suffering from this pandemic disease and some part of the country made the use of the AI but it is not so prominent. The country should change the attitude towards the AI treatments because it is for the whole development of the country and for the advancement of nation's healthcare sector.

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CHILD ABUSE: THE MAIN CHALLENGE FOR SUSTAINABILITY

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ABSTRACT

The term sustainability used for the ability to be maintained at a certain rate of level. Today's reference the sustainability is not only required in the field of economic, geography, political and environmental issues but also required in humanity. As per ratio of crime rates records all efforts for sustainability and discipline. According to our constitution all humans are important assets of a country. And for children it also implied. But now days many of crimes against the children becoming threat for the future planning & development. So if we want sustainability in every field then we have to first pay attention on crimes against children. The SDG are universal in scope and their call to leave no one behind puts the worlds most venerable and marginalized people including children. The protection of children from all types of crimes is a fundamental right of the child. The inclusion of specific target (SDG16.2) in the 2030 agenda for sustainable development to end the all forms of violence against children gives renewed impetus towards the realization of the right of every child to live free from fear, neglect, abuse and exploitation.

UNICEF is also responsible for SDG. It has 169 concrete targets measured by 232 specific indicators, 35 of these indicators are directly related to children progress for every child in SDG era a report released in march 2018 assessed the world's performance to date focusing on 44 indicators that directly concern the 2020 agenda's most vulnerable constituency children. This also reveals that the most countries that insufficient data to assess whether they are on track for this words.

UNICEF is working with 5 areas on SGD's agenda 2030. It is working on human rights based approach especially leaves no child behind. Policy they mark 17 indicators for it and the indicators 3, 4, 5, 16 are most important as per children security and equality.

The India has the largest population of children in world as the data's of 2011 census. so India have to accept the challenge of gender sustainability and focus on the policies for children welfare and the violence against can make the India very weak. So improve the strength and to achieve the goal of sustainable development India have to focus on child protection and development by make them fear free from any threat, by giving them proper education, health, opportunities and healthy environment to grow. Because there healthy and safe childhood will create the good future of India.

The goal of sustainability as safeguard of children cannot be achieved by only the government policies, every mankind have to give their contribution to make a healthy environment for children with equality, fearlessness, safety. Because politicians can make effective policy only but people can make policy effective. Make childhood safe and secure to be able for sustainable.

Introduction:-



Sustainability has become a popular word in today's perspective, It usually used in every field but the main thing is that where did the word come from? What does the actual meaning of sustainability for something?

The word sustainability itself has more recent origins, coined in German. The original term was *nachhaltig* meaning sustained field. It first appeared in a handbook of forestry published in 1713, and was used to mean never harvesting more than the forest can regenerate. The translated term appeared in English beginning in the mid 19 century.

So we can get that the sustainability focuses on meeting the needs of present without compromising without compromising the ability of future generations to meet their needs. Sustainability has three base or pillars are economic, environmental and social, also described as profit, planet and people, 3p.

The concept of sustainability is easy to put on paper but in practice it has many obstacles and problems and these problems are not solving managed yet.

In the case of sustainability is third pillar is the blend of above two pillars (profit, planet) is can be said the "soul of sustainability" because without the support and development of people the goal of sustainability cannot be succeed or achieved and has no worth. So in the sustainability all humans are considered for overall development.

As reference of above lines we can describe the children as the world's future constructors, should be most important part of sustainable development. Because it is the concept for a development which is done in present with the perspective of future. So the future generation of people are today children.

But in today scenario there are many challenges are present in front of world as the threat for childhood. The most challenging problem is gender issues of children. In this paper the focus will be on gender sustainability issues are discussed on children perspective. According to the S.C. India "Every child is the national assets of country."

But after this the environment is not safe for children. In Indian view If we want to do the sustainable development. Our first step will be to develop the every children in every aspect as social, educational, physical & mental environment because as per the census of 2011 the India the biggest population of children in the world.

So India has to accept sustainable development concept focusing on children. In Indian perspective there are so many challenges for children like child sexual abuse, child marriage, child labour, improper health & sanitation and malnourishment etc. So India has to fight all of the evils of society and then protect the child to achieve the goal of sustainability.

The renowned economist Dr. Jeffrey Sachs, director of the earth and resources institute said that. "India focus the challenges of achieving gender equality, urban sustainability and improving public health, while it builds infrastructure for its fast growing urban population.

So now it's clear that the sustainable development has many barriers in India. If the gender issues are has impact on children's development than sustainable development loses its goals and meaning. Because It is important for every country to give a safe and secure environment to children.

Importance of gender sustainability in perspective of children:-

As per the rule that every children has independent value, the development policies always consist there welfare in it. There are some points which can indicate the importance of sustainability in reference of children's;

1. Overall development focus on every people, which includes the children also.
2. The future of every country depends on the growth and development of children.
3. The term sustainability has own the meaning of resents developments without compromising the future needs.
4. Children can be the change agent for sustainability.
5. Children are the most important assets of every country to develop.

Data on gender sustainability (Special on children)

The sustainable Development goals (SDG) also known as the global goals, were adopted by United Nation Member states in 2015 as a universal call to action to achieve a better and more sustainable future for all by 2030.

UNICEF is working with governments, partners and other UN agencies to support countries around the world to ensure that the goals deliver results for every child. Progress for every child in the SDG Era a report released in March 2018, assessed the world's performance to date, focusing on 44 indicators that directly concern the 2030 agenda's most Vulnerable constituency children. These report state that is

- (i) Allmosta billion (945 million) children live in countries where the SDG's remain out of reach.
- (ii) Many children remain effectively uncouncted given the limited coverage of SDG Data, but this situation is improving.
- (iii) On average, 75% of child related SDG indicator in every country either has insufficient data or show inefficient progress to meet global SDG targets by 2030.

There are five dimensions of child program towards the global target-

1. Every child survives and thrives.
2. Every child learns.
3. Every child is protected from violence and explanation.
4. Every child lives in a safe and clean environment.
5. Every child has a fair chance in life.

The SDG's are universal in scope and their call to leave no one behind puts the most vulnerable and marginalized people including children. at the top of the agenda. The SDG attached to the goals are 169 concrete targets measured by 232 specific indicator, 35 of these indicator are directly related to children.

- According to the report 2019 most countries have insufficient data to assess. Whether they are on track to achieve the SDG targets for children.
- Available data show an alarming number of countries needing to speed up progress to reach global targets.
- Within countries, particular groups of children are at greater risk of being left behind such as children from poorer household those living in rural areas or often adolescent girls.
- Also include that an astounding number of countries need to speed up progress.



Also UNICEF child related SDG indicators are (i) Poverty (ii) Zero Hunger (iii) Good Health and well being (iv) Quality Education (v) Gender Equality (vi) Clean water and sanitation (vii) Affordable and clean energy (viii) Decent work and economic growth (ix) Reduced inequality (x) Sustainable cities and communities (xi) Responsible consumption and production, (xii) Climate action (xiii) Peace, Justice and strong institutions and partnership for the goals.

In All above the indicators gender equality, Peace, Justice and strong institution and partnership for goals are directly focusing on the reducing the exploitation and violence against children.

In the other hand according to appraisal: children in India, 2018 report by government of India, has include that:-

- i. Five state with higher prevalence of stunting in children under age five.
- ii. NCRB data reveals that rate of crime against children (below 18 year of age) has increased to 24 per Lakh children in 2016 from 21.1 in 2015.
- iii. Kidnapping and abduction of children are the highest registered category of crime against children in 2016.
- iv. Under production of children sexual offences act, 2012 (POCSO) crimes reported areas high as 34.4% of total crime against children.

Besides these data more other data's make shokings us on child security are :-

- i. Child rights social worker and noble prize winner "Kailash satyarthi" declares the child abuse as "Moral Epidemic."
- ii. Development of women and child welfare government Indian 2007's reports shows that 53% children have abused means every seconds child.
- iii. In 2015 the government of India accepts the "Zero tolerance policy against the violence against the children.
- iv. In 2015 -15,000 cases, in 2016- 36000 cases are filed in POCSO act.
- v. Child pornography is also become a major issue.
- vi. In incidents of child sexual abuse are increasing day by day.
- vii. Not only are the girl child abused. But also the boys were abused in many ways.

Above these data's shows the vulnerability of children security it is the biggest challenge for Indian policy make to ensure the safety and security of children to achieve the gender sustainability in future perspective.

Conclusion:-

Regarding above data we can say that the indicators and targets described by UNICEF are totally appropriate for child protection against abuse, harassment, exploitation, violence, inequality and many other social evils. An unsafe, exploited child can never be able to give its participation in any type of development, so today's reference the sustainability term is not only required in economic, geographical and environmental fields but also important in childhood development policies, because the crimes against children are increasing day by day. So remove these social evils we have to apply the sustainability concept. The protection of children from all type of crimes is a fundamental right enshrined in the UN convention on the right of the child. So today's scenario India have to accept the challenge of gender sustainability and focus on the policy for children's proper development and welfare., India have to take action against



the crimes, improper environment, unhealthy condition, gender issues and violence against children to make or development the children fear free and correctly.

The crime against the children not only challenging for society but also they have long term affects on a child's personality which includes mental, behaviour and physical effect. This effect can damage the whole life of a child. And an unhealthy personality never makes a good future. So to make their healthy personality and to gave them fear free life the children's sustain development is very important for it. This safe and healthy childhood have the ability to change the gear of development and can create the golden future of India.

In this field Indian government has done much work like accepting the child rights in constitution (1992) settle the National commission for protection of child Rights (NCPDR), National policy for children 2013, POCSO acts 2012 and many policies. But there are so many gaps blow the implementation and practice or outcome.

Now the time to fill the gap b/w the implementation and practice and take the responsibility to ensure the safe childhood, every Indian adult have to work for it and give their participation in achieving the goal of sustainable development.

The development and the change in the mind for children cannot be come by the government policies. The policies are easy to make but hard to implement but If we try together nothing will be impossible Our support make our country, stats, society and laws very powerful not only one initiative can change the world but a keep trying is more important. Our safe children, our future. We all know that so to make our children's life easier we have to aware and active to make them safe from any violence, exploitation abuse or inequality, Every development a initiative of one idea but a result of many efforts Sustainable development regards Children is only idea but our efforts make it dream come true. If will succeed in it, we can achieve the goal of SDG with in overall basis.

“Make the children is life safe and stable
It is an important cable
To be actually become
Sustainable”

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**Comparative Study on a New Species of *Tripospermum* (*T. cedrelatooae* sp. nov.)
in Nauradehi forest of Sagar M.P.**

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Abstract

Tripospermum cedrelatooae sp. nov. collected from the leaves of *Cedrela toona* found in Nauradehi forest reserve of the Madhya Pradesh state. *T. cedrelatooae* sp. nov. shows difference from previously described species (*T.myrti* and *T.fici*). Hyphomycetous fungi infecting mainly living leaves.

Key word: *Tripospermum*, *Fungi*, conidiophore

Introduction

Nauradehi wild Life Sanctuary (NWLS) was established in 1975, located at the junction of Sagar, Damoh and Narsingpur districts and is the single largest forest block of the area.

Encompassing an area of 1197 Sq.km NWLS is a unique protected area having two major river Basins.

The generic name *Tripospermum* was published by Spegazzini(1918). Hughes (1951) proposed four new combinatious *T. juglandis* (Thum.) Hughes, *T. fructigenum* (Robenhorstex, Saccardo & Trotter) Hughes, *T. myrti* (Lind.) Hughes and *T. rouplae* (Sydow.) Hughes. Tripathi has been reported a new species of *Tripospermum T.flacourtiarum* in Nauradehi wild Life Sanctuary (Tripathi and Mishra, 2018).

During a mycological survey of fungi associated with leaves in the Nauradehi wild Life Sanctuary of Madhya Pradesh state, an fungus was collected from the leaves of *Cedrela toona*.

Materials and Methods

Infected fungal specimens were collected from Singpuri, Saara Range, Nauradehi (W.L.S.), South sagar Forest Division, M.P. India.

After the collection of infected leaves the specimens were pressed. The slides were prepared by scrapping and free hand sections in lactophenol- cotton blue mixture. Identification were made with the help of available literature. Camera lucida drawings, description and illustration were made of interesting forms. The infected leaf specimens have been deposited in H.C.I.O. New Delhi.

Result and Discussion

Tripospermum cedrelatooae S.N. tripathi sp. nov.



Maculae ampigenosae, pleraeque epigenosae, irregularia, parvae sed evadentes magnae et coalescentes aetate progredientes se exetendes per totam superficiem folii atro. Coloniae, effuse, epiphyllae atro latescentes, per totam superficiem folii. Mycelium ex hyphis superficiales, ramosis, reticulates opus pluriseptata, constrictis ad septata tenuibus tunicata laevia, fuscae olivacea vel pallide brunneae usque 7-8 m crassa. Stromata, setae et hyphopodia nullum. Conidiophora semi macronematosae, mononematosae, recta vel flexuosa, laevia, simplicia, septata, tenui tunicata 3.5-7 m crassis usque 21-63 m longa, versus apices pallidiora, moderate vel obscure olivacea. Cellulae conidiogenae mono blasticae, integratae, terminales, determinatae, cylindricae. Conidia solitaria, sicca, acrogenosa, glabra, cellulae strip 1-2 cellulae, mesurata 5.8-8x 4.5-8 m ramosae, conidicus branchium 2-4, recta vel flexuosa, usque, 2-6 transversae septata, 14-52 m longa usque 7-10 m crassa ad basim et usque 1.5-3 m crassis ad apices, plus constricta ad septata, sphericis vel ovoides, pallide vel moderate olivacea, hyalina ad apices.

In foliis vivis *Cedrela tonna* Roxb. (Meliaceae) January 1998, Singpuri, Sarra Range, Nauradehi (W.L.S.), South Sagar Forest Division, M.P. India, leg. S.N. Tripathi, S.U. Herb. No. SNR 254 holotypus, HClO 43.912.

***Tripopermum cedrelatoonae* S.N. tripathi sp. nov**

Lesions amphigenous, predominantly epigenous irregular, small but becoming large and coalescing with age to cover the leaf surface, black colonies effuse, epiphyllous, black scattered all over the leaf surface, some places overloaded with black powdery mosses. Mycelium of hyphae superficial, much branched forming a dense network, multiseptate, constricted at the septa thin walled, smooth, drak olivaceous to brown, upto 7-8 m thick.

Stromata- Stromata, setae and hyphopodia absent.

Conidiophores semimacronematous, mononematous, straight to flexuous, smooth, simple, septate, more or less constricted at septa, thin walled, 3.5-7 m, up to 21-63 m long. Paler towards the apex, mid to dark olivaceous. Conidiogenous cells monoblastic, integrated, terminal, determinate, cylindrical.

Conidia solitary, dry, acrogenous, smooth, stalk cells one or two celled measuring 5-8x 4.5-8 m branched, conidial arms, 2-4 armed, straight to flexuous, 2-6 transversely septate, 14-52 m long, upto 7-10 m thick at the base, upto 1.5-3m in diam. at the apex more constricted at the septa, spherical to ovoid, light to mid olivaceous, hyaline at the apex.

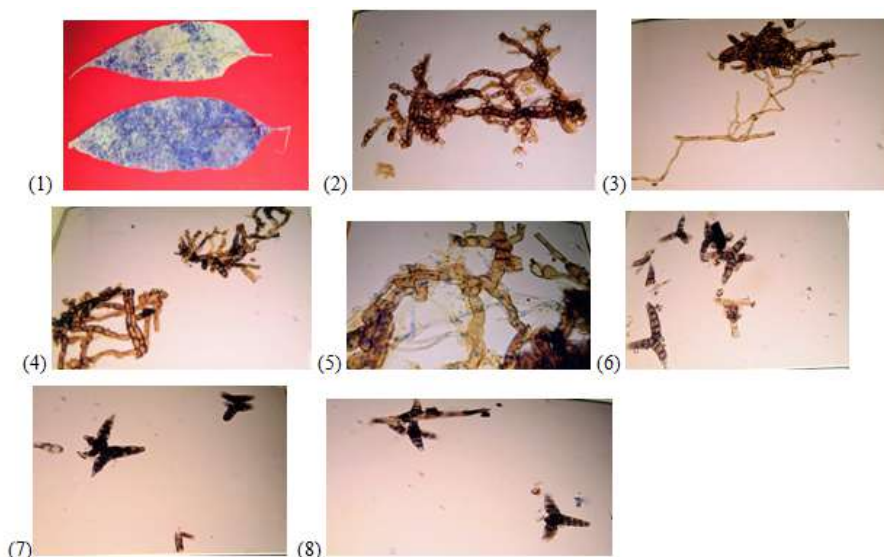


Fig.1 *Tripospermum cedrelatooae* sp. nov. 1. Infection on *Cedrela tonna* leaf, 2-5. Superficial hyphae and Conidiophores, 6-8. Conidia.

Table-1. Comprative study of *Tripospermum cedrelatooae* sp. nov. with related species.

Species	Colonies	Mycelium	Conidiophores	Conidia
<i>T. myrti</i> (Lind.) Hughes (1951)	Mycelium from a black, effuse, thin epiphyllous, superficial, crust like colony.	Composed of brown repent hyphae, more or less straight, the individual cells are 6 to 12x 4-8 m.	Erect, arising as septate lateral branches of the repent mycelium, pale brown subhyaline at least 90 long.	4 armed, with an oval, apiculate or pyriform stalk cells 1-2 celled, conidial arms slightly constricted at the septa, hyaline to pale brown, paler at the apices and upto 4 septate, 4-8 m wide at the base and 2-4



				m at apex stalk cell 4-7 m
<i>T.fici</i> sp.nov. Sharma (Ph.D Thesis) (1994)	Colony effuse, strictly epiphyllous black, associated with sooty mould Superficial detachable.	Superficial, much branched, forming a dense network, multiseptate, dark oliv. to light brown upto 3-5m thick.	Straight to flexuous, smooth more or less constricted at the septa thin walled, oliv. brown towards the apex 1.5-7 m thick and upto 16-48 m long.	Solitary 3-4 armed 1-2 stalk Cells arms straight, more at constricted at the septa, light to mid oliv. hyaline at the apex arms 8-60m thick at the base and up 5 m at apices, stalk cells 6.5-9x 2-6.5 m.
<i>T. cedrelatoonae</i> Sp.nov.	Lesion amphigenous, predominantly, epigenous, irregular coalescing, colonies, effuse, epiphyllous, black scattered all over the leaf surface, some places over loaded with black powdary mass.	Mycelium superficial much branched, multiseptate, constricted at the septa, thin walled dark oliv. to brown, upto 7-8 m. thick.	Conidiophores straight to flexuous, thin walled paler towards the apex, more or less constricted at the septa, mid to dark oliv. 21-63 m long and 3.5- 7m thick.	Conidia 2-4 armed, with a stalk cells, 1- 2 celled upto 5-8 m long and 4-5 m thick conidial arms, light to mid oliv. hyaline at the apex, multiseptate, up to 6 transversely septate, 14-52 m long, upto 7-10m thick at the base, upto 1.5-3 m in diam. at the apex.



On the living leaves of *Cedrela toona* Roxb. (Meliaceae) January 1998, Singpuri, Sarra Range, Nauradehi (W.L.S.), South Sagar Forest Division, M.P. India, leg. S.N. Tripathi, S.U. Herb. No. SNR 254 holotypus, HCIO 43.912. Tripathi and Rai (2015) and Verma(2012), Tripathi and Mishra (2018) studies on some hyphomycetes fungi . *Tripospermum myrti* (Lind.) Hughes (1951) and *T.fici* Sharma Ph.D. Thesis (1994), are the only two species taken in to consideration for the comparison with the present fungus (Table-1). A look to the data show that our specimen matches with the conidial structure, and the dimensions with *T.fici* only, and not with *T. myrti* (in conidial size). Other characters like mycelium and conediophores (of present species) do not find similarity with any of the described species. It is also gathered that no *Tripospermum* has ever been reported on *Cedrela toona*. Therefore in my view it deserves its placement as a new species i.e. *Tripospermum cedrelatoonae*.

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Bharatārṇava Perini

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Abstract:

The word Perini¹ was used by most of the authors in their treatises. Some authors used it as one of the uparupakas. The ultimate meaning of the word Prerana by ever it was used means that it is a one act play consisting comic sentiment.

Perini was not mentioned in Bharata's Nāṭya Śāstra even by the scholars who studied Nāṭya Śāstra. Nandikeshwara was the pioneer of those who had mentioned Perini² in his treatise Bharatārṇava. A detail study of Perini dance form from the treatise of Nandikeshwara's Bharatārṇava.

Introduction:

Bharatārṇava of nandikeshwara is the whole work is said to have 4000³ slokas. But this Bharatārṇava treatise translated by K. Vasudeva Sastry contains 15 chapters running over some 800 slokas. From the manuscript obtained from the other libraries, specially the one from the B. O. R. institute library, Bombay and another from Misore Oriental Library, they (Swaraswathi Mahal library) have added some 400 more slokas. Let us go into Nandikeshwara's Bharatārṇava treatise.

Nandikeshwara had given a brief extraction of seven types of Lasyas (Sapta Lasyas) and its elements, and uses of cāris, Sthanakas (simple standing positions) from the treatise Bharatārṇava Lakshna⁴.

Nandikeshwara's Bharatārṇava⁵

¹ According to Bharatarnava treatise, Perini has been termed as Preruṇi, Sangitaratnakara of Sarangadeva termed as Preruṇi, Abhinava gupat termed as Prerana, Jayapa in Nrittaratnavali termed as perani. But I continue with the term 'Perini' which is popularly known term.

² See Vasudeva Sastry's Bharatarnava of Nandikeshwara page 371.

³ See Abhinayadarpana Telugu translated treatise by Dr. P. S. R. Appa Rao. In preface (avataarika) from 2 to 9 slokas, page No.5-9.

⁴ *tāṇḍavānām gatīnām ca katham śabdaprayogātā |
sumate śryatām samyaggyāgñavalkyō mahāmuniḥ* 762

tāṇḍavānām gatīnāṇca bharatārṇava lakṣhaṇe||

Nandikeshwara replies "I shall now explain how and why of the use of the syllables in dance as explained by Yagnavalkya in his Bharatarnava Lakshana". But it is not available

⁵ Vasudeva Sastry K. Bharatarnava of Nandikeshwara, Publisher Director Saraswathi Mahal Library, Publication No. 74, Thanjavur, December 1998.

He gave clear information about Perini⁶ and its five parts, Perini quality, costume and mode of dance. And also he explained about Cāris⁷, Karaṇas⁸, sthānakas and tālas (Measurements) including jathi mridanga syllables which are to be used. He just took a little information from Yagnavalkya's Bharatārṇava lakṣhaṇa⁹.
Sapta Lāsya¹⁰

*śuddha lāsyaṃ deśikā ca preraṇā preṅkhaneti ca |
kundaḷidandikā cāpi kalaśah saptadhā srutih ||730*

He elucidates Sapta Lasyas in the chapter thirteen.

1. Suddha, 2. Desi, 3. Preraṇa (Perini), 4. Preṅkhana, 5. Kundali, 6. Dandika and 7. Kalasa
Perini:

*bhasmādisvetaliptāṅgō bibhratskandhaśikham śirah |
bhrājadghargharikājālajanghh śārīrapeśalah ||731||
pancāṅga kuśalastāla kalālaya vicekshaṇah |
sabhñjanmanōhārīṇṛttavyapreraṇī matah ||732||*

In Perini abhinaya the dancer applies ash all over the body. He leaves his hair up to shoulders and the gungoroos named 'gharghara' tied to the shanks and keeps the body in a gentle mode. The dancer must be well-versed in its five parts (Panchangas) and must have the knowledge of the talas and its elements of Kāla (timing) and Laya (rhythms). In this way the Perini dancer begins 'perini abhinaya' to entertain the spectators.

By Sumathi's¹¹ request Nandikeshwara revealed the Sapta Lasyas which were briefly extracted from the treatise 'Bharatārṇava Lakṣhaṇa'¹², written by Yagnavalkya. In these, Sapta Lasyas focused on Perini and its panchangas in a very detailed manner.

⁶ According to Bharatarnava treatise, Perini has been termed as Peruṇi, Preraṇi, Preraṇa, perani. But the researcher just continue with the term 'Perini' which is popularly known term.

⁷ Cāri: the harmonized coordination of the foot, calf, thigh and waist is known as 'Cāri'. All actions with one leg is called 'Cāri'. There is no dance without Cāri actions.

⁸ Karaṇa: Karaṇa are the 108 key transitions in the classical Indian dance described in Bharata's Nāṭya Śāstra. Karaṇa is a Sanskrit verbal noun, meaning "Doing". Karaṇa's are mixture of dance movements.

⁹ *śṛyātāmavadhānena sumate nāṭyalakṣhaṇam |
ācāryā bahavassanti bharatārthvicakṣhaṇāḥ ||710
teshu nāṭyaviśeshagnau yāgnavalkyo mahāmuniḥ |
bahuni tāṇḍavāni syuh kalpitāni śivenatu ||711
bhadrakālyā cha sakṣhiṭya tānyeva paripalpayet |*

"According to Yagnavalkya's Bharatarnavakṣhaṇa, Nandikeshwara says – Lord Shankara and Bhadrakali were invented and composed various types of Tandavas from his treatise I am going to explain these Sapta Lasyas in brief"

¹⁰ See pg. 369

¹¹ Sumati is Indra, according to Abhinayadarpana Telugu translated treatise by Dr. P. S. R. Appa Rao. In preface (avataarika) from 2 to 9 slokas (page No.5-9), he introduced and explained the purpose of Bharatarnava explaining to Sumathi i.e. kalyāṇācala vāsāya karuṇārasasindhava |

Perini pancha anga:

*Ghargharō vishamam bhāvāśrayaśca kavicārahah |
gītamceti samāceṣṭe pañcāṅgāni harapriyah ||733||*

The five angas of Perini are 1.Gharghara, 2.Vishama, 3.Bhāvāśraya, 4.Kavicāraka and 5.Gītam which are favorite to Lord Siva.

1. Ghargharika

Types of Gharghara

*paṭipāṭaścāpadapah śiripīṭyalaḡādimah |
pāṭaścīrihirākhyāśca tatah khuluhulāhvayah ||734||
iti gharghārikābhedāh śaḡamī tadvidām matāh |*

The six types of Ghargharika were told by scholars' namely-1.Paripāṭa, 2.Cāpdapa, 3.Siripīṭi, 4.Alagapāṭa, 5.Cirihira and 6.Khuluhula.

i. Paripāṭ

*bhūmilagnāgrayōranghrayOh paryāyātbhūmikuṭṭanam|735|
pārshnīdvayena pārshnyā vaikayā syātpaṭipāṭakah||*

The up-and-down (kuṭṭana) movement on the ground of both the heels one after the other, or of one heel, with the forepart of the heel held to the ground is paripāṭ.

ii. Cāpdap

bhaveccāpdapah pādtalenāvanikuṭṭanam||736||

Striking the ground with the sole of the foot with an up and down movement is called cāpdap.

iii. Śiripīṭi

namostu nandikeśāya nātyaśāsrāthadāyine||2
swāgatam te surādhiśah kuśalam tridivaukasām|
kimartha māgatam brūhi bhavatā mama sannidhau||3
tvadīya kṛpayā pūrvam nātyaśālā malamkṛtām|
tvadīya nartakah sūyam tvatkrpā mabhivāncchati||4
mayā vidheyam kim ṭanya vada vāsava tattvatah|
daiteya nātyaśālāyām nartako nātaśekharah||5
tam vijetu mayam nātyavinodaih kramavedibhih|
bhavadviracitam grantham **bharatārṇava** micchati||6
catussahasra sankhyākaiḥ granthaiśca paripūritam|
bharatārṇavaśāstram tu sumateh śṛṇu sādaram||7
nandikeśah dayāmūrteh vistaram samvihāya me|
samkshipya nātyaśāstrārtham kramapūrvā mudāhara||8
vadāmi sumateh devah **samkshipya bharatārṇavam**|
darpaṇākhyā midam sūkshma mavadhārāya sādaram||9

According to the verses– Once Indra came to meet Nandikeshwara to help him in the scientific joyful dance contest with a great titan's dancer named Natashekara. So he approach Nandikeshwara to know about his Bharatarnava which is in 4000 slokas, he requested Nandikeshwara to explain in brief. Then Nandikeshwara has accepted his request and abridged Bharatarnava to 'Abhinayadarpana'.

By this Hindu mythological story the researcher understand the purpose of asking the questions to know about the dance which is written in Bharatarnava treatise to win in the scientific joyful contest with Natashekara.

¹² English translation of Sri Vasudeva Sastri's Nandikeshwara Bharatarnava treatise See verses from 762 – 764, pg 383.



*talenabhūmilagnena pādasya saraṇam punah|
tathāpisaraṇam paścānmuh siripīṭibhavet||737||*

Sliding the foot forward and backward repeatedly with the sole holding the ground is siripīṭi.

iv. Alagnapāt

*dvayōścara ṇyorvyōnmi paryāyeṇaprakuṭtanam|
yatkutamkōmalam sōtrālagpāṭah prakīrtitah||738||*

Shaking both the feet gently in the air one after the other is called alagnapāt.

v. Cirihiṛā

*satyekasminsama pādenyaghrih purah preritōparah|
yatra syātjanghyā kampō ghīrāscirihiram viduh||739||*

Keeping one foot in the Sama position, the foot is pushed forward and its shank shaken. Or shaking the shanks keeping the both feet naturally on the ground is called cirihiṛā.

vi. Khuluhulu

*bhūmilagnāgravāmāṅghreh pārshnyā yatbhūmikuṭtanam|
bhūlagagnasya cānyasya bhramh savyāpasavyatah||740||
yōsav khuluhuluh prōktō ghargharō nṛttakōvidaih|*

The up and down movement on the ground with the heel of the left foot while its forepart is kept touching the ground, and the circular movement to the left and right of the other foot, also kept with its forepart touching the ground, constitute the kuluhula type of gharghara according to experts on dancing. In the same way other kinds of ghargharas may also be thought out. All these types of ghargharas must be done in tala.

2. Vishama

atra yōtplitipūrvam syātkaraṇamvishamābhidham||741||

Vishama is the name given to the karanas starts with leap (utplutikaranas).

3. Bhāvāśraya

vikṛtārthānusārastu budhairbhāvāśrayō matah|

Bhāvāśraya is accepted by the scholars as the imitation of the awkward or abnormal (vikṛta) (creat comic effect things).

4. Kavicāra

Kavicārō bhavedtrōttamnāyakavarṇanam||742||

Kavichara is the description of the hero of high character.

5. Gītam

atra syātsālagam gītam yaduktam kuṇḍalīvidhau|

Here Gita is refers to the salaga (songs) prescribed for the Kundali¹³.

Joining of cāris and karanas in perini Lasyas:

*peruṇī kalaśānteshu kevalam śabdanāṭikām||752||
ante karaṇcāribhyām yōjanām paribhāvayet|*

¹³ Sapta Lasyas – Suddha Desi Preruni Prenkhana **Kundali** Dandika and Kalasha.



From Perini to Kalash (i.e. Perini, Prenkhana, Dandika and Kalasha) it follows only 'shabda-natika'(Tala) and it ends with joining of karanas and cāris.

- Means it has to dance according to the Tala Syllables but not to lyric. It does not have lyrics for abhinaya like other classical artforms performance.

hairambkaraṇam cārīm tāmapasyanditābhighām||753
peruṇṇaṭaṇānte ca yōjayetkuśalīṇaṭah|

At the end of the Perini dance the dancer has to execute the Hairamb karan and upasyandita Cāri cleverly.

evam karaṇacāryah syuh peruṇṇādhye ca nartane||756
cārīdarpaṇmityāhuh nāṭyaśāstraviśārādāh|
peruṇṇikalaśāntānām ityevam meḷanam kramāt || 757

The learned says - the combination of Cāris and Karanas execution in the form of Perini to kalash are to be named as "Cāri-Darpan".

meḷanāt saptaśyānām gatitāṇḍavabhāvinām|
cārikaraṇayuktānām cāribhūshaṇameva tu||758

And the combinationa of Sapta Lasyas with gathi, cāri, Tandava and karanas is known as "Cāri-Bhushan".

Sapta Lasya's Creators¹⁴:

Śuddhanāṭyam śivaścakre deśinī pārvatī tathā|
peruṇṇīm padmasambhūtaḥ prenkhaṇīm śaradāpi ca||760
kunḍalīnāṭyakalanām kalayāmāsa mādhevah|
dandikākalaśe nāṭye nanartkamalālayā||761

Shudha by Lord Siva, Desi by Parvathi, **Perini by Brahma**, Prenkhana by Saraswathi, and Kundali, Kalash by Lakshmi these are the deities who created and performed these Lasyas.

The usage of Talas in Tandavas:

tāṇḍavānām gatīnānca katham śabdaprayōgatā|
sumate śṛyatām samyagyaṅnavalkyō mahāmuniḥ||762
tāṇḍavānām gatīnānca bharatārṇavalakṣaṇe|
nāṭyaśabdakramam samyaguktavāṅkramapūrvakam||763
katham karaṇacārīṇām yojanā nandikeshwara|

¹⁴ *Śailāde kena vā pūvam naṭitam tadveda kramāt|*
Sumate śṛyatām samyaksāvadhāna purassaram||

Sumati asked Nandikeshwara, who are the originators of all seven dances? Nandikeshwara replied...



The joining of Talas in between tandavas and gatis is as how Yāgnavalkya had told in his Treatise Bharatārṇava Lakṣhaṇa¹⁵, “I’m (Nandikeshwara) going to explain listen carefully!” (Sumathi)

In Fourteenth chapter, he explained about the uses and importance of talas in Gatis¹⁶ – Karanas – cāris. He explained about the talas which are used in gatis, karanas, and cāris which were accepted by Siva and Parvathi and at the same time they composed tala sounds (Śabda) syllables of mridanga to karaṇas and cāris for these Sapta Lāsya.

From Perini to Kalash the five elements (Perini, Prenkhana, Kundali, Dandika and Kalash) the dance has to follow these syllables and concludes with the combination of karaṇas and cāris.

For Perini:-

brahmānandākhyatālena peruṇīm parinartayet|

With **Brahmānanda Tāla**¹⁷ the Perini Dancer has to Dance.

The syllables as follows:

dhari kukukunāmjhakukukutā – kiṭatarijagaṇāmtothari – kuthajham – kiṭatakatakajhem – kiṭathomgathā – takajakakukunakakuthā – jaha – kiṭa – takajanakumjhe – jakatakajanajhemjhemjhem

kiṭatattatakutharikiṇathā – takiṭamtalamgiṇṇatanujaganatājhem – kiṇṇakiṭathomgā – kitakiṭa – kukuje – thariṇakiṇakiṭakukuthā|

Hand gestures (Hastas) in Perini:

evam prakāra śabdānām naṭanādau tadantake||865

sthānakam brahmānandāya kapiṭṭha śikharau karau|

The Perini dancer has to dance to the above syllables and then execute Brahma sthanaka (Sthanak No.25) by wearing *Kapiṭṭha (Asamyutha Hasta No.11)* and *Sikhara Hastas (Asamyutha Hasta No.10)* in hands.

hairabhakaraṇam (Herambha karana) tathā

niveśitau hr̥di karau pārśvamaṇḍalinav yadi||866

vāmadakṣiṇayoh śīghram deham tadanugam bhavet|

etad hairabhakaraṇam proktam harimahibhujā||867

There after he needs to perform hairambha Karan

Hairambha Karan: If the two hands starts from chest and then excute Parshvamandali mudra (Nritta Hasta No. 18) and move in speed to left wards and right wards while doing this the body has to perform ‘Tadanurup gathi’. It is created by lord Ganesh so it is named as “hairambha” and concludes with the Apasyanditha Cāri.

syanditāyā viparyāsātsyādapasyanditā matā|

¹⁵ This treatise is not available.

¹⁶ Gati: Refers to Gait, it is a Sanskrit technical term defined in the Bhatara’s Nāṭya Śāstra, chapter 12. these gaits are suitable for different characters in a dramatic play.

¹⁷ Just he mentioned the Brahmaananda tala but he did not give the signs and format of tala.



It is an exact reverse of Syandita-cāri and is named 'Apasyanditha-cāri', in this the left foot is in normal position, the weight of the body is rested on it and the other foot (right foot) has to be extended in an oblique direction to five talas distance.

This tala had not been in the treatise, it would have been lost.

Conclusion:

In 5 parts of *Prēruṇi* - in the first and second part i.e. *Garghara* and *Vishama* he stressed on practice of footwork a preparation to dance. He told the dancer to do these six types of foot works in *garghara* part. In *Vishama* he had not given a specific name to *Karana* or *utpluti/leap* to perform, just he mentioned that the dancer had to perform leaps/jumps before execution of *Karana*. Not mentioning any specific name to *utpluthi* and *Karana*. Did he give any scope to elaborate performance? Or execute in various types that are present in it? Absolutely Yes! He had given scope to extend or elaborate the performance in several ways.

And in the third part, *Bhāvāsraya* - he stated *Abhinaya* in a different manner that the dancer has to follow or imitate in an awkward or abnormal way to create a comic effect. Just he said *Vikṛta+artha+anusāra* which mean that the dancer had to imitate though present in a clumsy state. But he did not mention whether the dancer had to follow the imitation of human beings or animals. Again he had given scope to *Bhāvāsraya* too. In this part he had given a wide scope to the dancer to create a comic pleasure therefore the spectators can relax with this effect.

In the fourth part, *Kavicāra* - in *Kavichara* he clearly mentioned that the dancer had to praise the good qualities of the king. And he did not mention about the time period of kings, so in this part he had given an extensive scope to perform the dance because so many kings ruled this country from centuries and the dance has a scope to perform various 'Kavicharas' and is also similar to the present days "Śabdham"¹⁸ which is being used in *Kuchipudi* and *Bharatanāṭyam* repertoire. But this 'Śabdham' is in praise of deity or king, which is somewhat similar to *Pēriṇi Kavichara* but in *Kavichara Nandikeshwara* has defined clearly that it has to praise only King's good qualities but he did not mentioned about deities'.

In the fifth part, *Gītam* - he mentioned the *sālagas* (songs) which are used in *Kuṇḍali vidhi* that had to be used for *Gītam*. But in the *Kuṇḍali vidhi* what type of songs are used. The description of *Kuṇḍali natyam* is missing¹⁹. So it is a big question on how it is known? And which type of *gītas* had been used for *Pēriṇi* in those days? And that we unfortunately missed as it is unavailable.

At the time of *Nandikeshwara* these *Sapta Lāsyas* might be highly prevalent therefore he discussed it in his treatise. If the treatise *Bharatārṇava Lakshna*²⁰ was found, it would

¹⁸Court oriented dance. This item contains in it the praise of kings or deities.

¹⁹See *Bharatārṇava* English translated book by K. Vasudeva Sastri, footnote-1, pg:380

²⁰ Abid see page 361.

The verses: *tēshu nāṭya viśeshagnō yāgnavalkyō mahāmuniḥ||706*
Bahuni tāṇḍavāni syuh kalpitāni śivēnatu|
bhadrakālyā ca samkshipya tāyēva parikalpayet||707
tāṇḍavānām gatīnām ca katham śabdaprayōgatā|
sumatē śrūyatām samyagyāgnavalkyō mahāmuniḥ||762



be a great advantage for the dancers to recreate pure Sapta Lāsya and it might be developed into a separate genre of Indian dance forms.

Nandikeshwara had given a scope to develop these Sapta Lāsya. But it is unfortunate to lose many of these original leafs of Bharatārṇava treatise. Therefore this treatise looks incomplete and unfinished²¹.

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*tāṇḍavānām gatīnām ca Bharatārṇavalakṣhaṇē/
bhagavānnandikēśāna yāgnavalkya munīśvarāt||765*

706: By sumathi's request "Nandikeshwara" explains about Sapta lāsya;

"Listen! Of the many masters well-versed in the art of dance "Maharshi Yagnavalky" is proficient in its special branches. Lord Parama siva created many types of tandavas/dances as also Bhadrakali the competing aspect of his spouse" These types are to be simplified and used in dance performances".

762: Nandikeshwara replied "I shall now explain how and why the use of syllables in dance as explained by Yagnavalkya in his Bharatarnava Lakshana"

765: sumathi then expressed his desire to hear all the details about the dance that the latter had heard from "Yagnavalkya"

²¹ The whole work is said to have 4000 slokas. But this Bharatarnava treatise translated by K. Vasudeva Sastry contains 15 chapters running over some 800 slokas. From the manuscript obtained from the other libraries, specially the one from the B. O. R. institute library, Bombay and another from Misore Oriental Library, they (Swaraswathi Mahal library) have added some 400 more slokas.



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“ श्रद्धास्त्व सोम्य ” इत्यस्य विवरणं भाष्यकारः शङ्कराचार्याः एवं विवृण्वन्ति । द्रष्टुमशक्यात् अत्यन्तसूक्ष्मात् वटबीजात् यथा महान् वटवृक्षः संजातः एवं अत्यन्तसूक्ष्मात् , सद्रूपपरमात्मनः स्थूलं नामरूपादिमत् कार्यं जगदुत्पन्नमिति अनन्तरं श्रद्धायाः आवश्यकताम् एवं प्रतिपादयन्ति तथापि अत्यन्त सूक्ष्मेष्वर्थेषु , यद्यपि न्यायागमाभ्यां निर्धारितोऽर्थः तथैवेति गम्यते ” बाह्यविषयासक्तमनसः स्वभावप्रवृत्तस्य असत्यां गुरुतर श्रद्धायां अनवगमत्वं स्यादित्याह । श्रद्धायां तु सत्यां मनस “श्रद्धास्त्विति”ः समाधानं बुभुत्सितेऽर्थे भवेत् ततश्च तदर्थवगतिः । “

वेकचूडामण्यांच श्रद्धास्वरूपमभिवर्णयन्त्याचार्याः ---

शास्त्रस्य गुरुवाक्यस्य सत्यबुध्यावधारणम् ।

सा श्रद्धा कथ्यते सद्भिर्न्या वस्तूपलभ्यते ॥

एतेनावगम्यते यत् लैकिकं वा अलौकिकं वा यत् किमपि तत्त्वं सम्यगवगन्तव्यं चेत् श्रद्धा आवश्यकीति । पाश्चात्या अपि इमां श्रद्धां अङ्गीकुर्वन्ति । Sir Arthur Iddington (The Philosophy of Physical Science) . “In the age of reason, Faith et remains supreme for reason is one of the articles of faith.”

Albert Einstein मतानुसारं Science without faith is lame (पंगुः) . (Faith without science is blind) (अन्धः अतः श्रद्धोपपत्त्योः सहकारेणैव सूक्ष्मवस्तु अवगमनं भवतीति वेदानतः) . (न्यग्रोधबीजं दृष्टान्तेन उपपादय (छान्दोग्योपनिषत्) इति । तत् अधुना तनकालेऽपि अत्यन्तमुपकरोतीति किमुक्तव्यम् ।

भारतीयानुसृता या तथान्वेषण पद्धतिः सा अति पुरातनाऽपि नित्यनूतना इति अवगम्यते । युक्तिगर्भिता श्रद्धा अथवा श्रद्धा सहिता युक्तिरेव संपूर्णफलदायिनी भवति । एतादृशी श्रद्धा बाल्ये एव वयसि नचिकेतसि आसीदिति कठश्रुतिः श्रावयति तं कुमारं सन्तं श्रद्धा ” “ आविवेश इति । अत एव सः ज्ञानसम्पन्नः प्रसप्राप्यः कृतकृत्यः च जातः ।

अत्यन्त सूक्ष्मं वस्तु एकाग्रहीनया बाह्यासक्तया बुद्ध्या ग्राह्यं न भवति । एतादृशी बुद्धिः स्थूलग्राहिणी भवति । आध्यात्मिकं वा आधिभौतिकं वा वस्तुतत्त्वं तु सूक्ष्ममेव भवति । अतः सत्यान्वेषिभिः स्थूलरूपं आपाततः दृश्यमानं परित्यज्य सूक्ष्मदर्शिभिः भाव्यमिति कठोपनिषत् प्रतिपादयति---

परञ्चि खानि व्यतृणत्स्वयंभूस्तस्मात्पराङ्पश्यति नान्तरात्मन् ।

कश्चिद्धीरः प्रत्यगात्मानम् ऐक्षदावृतं चक्षुरमृतत्वमिच्छन् ॥ (१.१.२.४.क)

एतेन ज्ञायते यत् चक्षुरादीनीन्द्रियाणि वस्तुज्ञानार्थं उपयुज्यमानानि वस्तुनः पराग्रूपं प्रदर्शकान्येव भवन्ति न तदन्तर्हिततत्त्वं प्रतिपादयन्ति । अन्तर्हित तथ्यदर्शनं तु सूक्ष्मया बुद्ध्या अस्थूलग्रहिण्येवेति । अत एव श्रूयते---

एष सर्वेषु भूतेषु गूढोत्मा न प्रकाशते ।

दृश्यते त्वग्रया बुद्ध्या सूक्ष्मया सूक्ष्मदर्शिभिः ॥ (१.२.३.१.४.क) इति



पूर्वोक्ता श्रद्धा बुद्ध्याः उपकारिणी भवति सूक्ष्मतत्त्वदर्शने । अत एव पित्रा आरुणिना पुत्रः श्वेतकेतुः अनुशिष्टः “ श्रद्धत्स्व सोम्य ” इति प्रीत्या । गीता शास्त्रमपि श्रद्धावान् लभते ज्ञानं ” ४ गी) तत्परः संयतेन्द्रियः ।.९३ इति ।।

अन्वेष्यवस्तुपूर्विकां इन्द्रियसंयमयुक्तां श्रद्धां ज्ञानं प्राप्तौ हेतुत्वेन उपदिशति । श्रद्धायाः विरोधिनी भवति अश्रद्धा । इयमश्रद्धा अत्यन्तं निन्द्यते पुरुषार्थ विघातिकेति । गीताचार्यः इमामश्रद्धां निन्दति । इति(.४०.४.गी)अज्ञथाश्रद्धधानश्च संशयात्मा विनश्यति।”

Shri Ragnathand Mys in his lecture on science and religion- In English the attitude conveyed by this अश्रद्धा ,no faith in its fullest form, is expressed by a powerful word namely cynicism (believing that people's motives are selfish) कुटिलशीलत्वं ,निंदाशीलत्वं,वक्रभावत्वं ,

(सदावक्रत्वम् this cynical attitude (अश्रद्धा) is the characteristic of a cynic ,नास्तिकः)

(कुटिलशीलः one who has no faith in himself or in the world around him. His mind is afflicted with a totality of negative attitudes, here श्रद्धा signifies a totality of positive attitude which is that Acharya Bharat conveys by the term आस्तिक्य बुद्धिः (belief))

एवं प्रतिपादितरीत्या वेदान्त प्रतिपाद्याः ब्रह्मतत्त्व अधिगमाय उपायाः श्रवण मननादयः सक्रिय युक्तिगर्भित श्रद्धादयः अन्वयवितरेकादयः अन्ये इत्यादयः । उपदेशाः “मातृदेवो भव ” मनोनिग्रहार्थं उपदिष्टाः दोषदर्शनादि रीतयः एते सर्वेऽपि व्यावहारिक सत्यत्वेनाभिमतं अस्मिन् जगति यत्र वयं वसन्तः सांसारिक जीवनस्य संम्यक् यापनाय यद्यत् कर्मकुर्मः ज्ञानं धिगच्छामः यत्र यत्र गवेषणं कुर्मः तत्र सर्वेषु जीवनविधानेषु वेदान्त प्रतिपाद्याः श्रवणादि उपायाः आध्यात्मिक प्रलयपर्यन्तं उपकुर्वन्तीति सिद्धे । किमु वक्तव्यं अधुनाऽपि एकविंश शताब्द्यां उपकुर्वन्तीति ?



QUALITY OF LIFE OF ALCOHOL DEPENDENTS AFTER PSYCHOLOGICAL INTERVENTION

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Abstract

Although Alcoholism is one of the biggest public health crises in the world today. Alcohol abuse has affected people across gender, ages, and socioeconomic statuses. Alcohol misuse is a major cause of morbidity and mortality and an important health care burden, the Quality of Life (QoL) of alcohol misusing subjects has been little studied to date. In the present study, an attempt has been made to study the Quality of life of alcohol dependents after Psychological intervention. This pre-test and post-test study include 42 participants (alcohol dependents) age range 25-35 were screened on Alcohol Use Disorder Identification Test and their overall quality of life were assessed on WHOQOL-BREF. After that 21 each in the experimental and control group were selected randomly and statistical analysis ANCOVA was applied. Finding indicated the significant improvement on quality of life and the alcohol dependence usage of the participants of the experimental group than the control group after the intervention.

Keywords: Psychological Intervention, Alcohol Dependents, Quality of life

Alcoholism has significant harmful impacts not only on individuals but also on global public health. More than 3 million people died as a result of harmful use of alcohol in 2016, according to a report released by the World Health Organization (WHO, 2018). This represents 1 in 20 deaths. More than three quarters of these deaths were among men. Overall, the harmful use of alcohol causes more than 5% of the global disease burden. It is significant to note that alcohol kills or disables people at a relatively young age, resulting in the loss of many years of life to death and disability. Global status report on alcohol and health – 2018, therefore alcohol dependency is a matter of serious concern not confined to any group, culture or country. It is a complex disorder with physical, psychological and social aspects having far reaching harmful effects on the individual, family and society. Alcohol consumption is one of the ancient and complex disorders known in the history of mankind. It is an illness that adversely affects the life of the individual as well as the lives of those around them.

Frequent heavy drinking or episodic heavy drinking were not only associated with risks and its hazardous issues however it also has a direct impact on the Quality of Life of the individual, family, society and nation at large. Alcohol dependents had significantly lower the levels of Quality of Life compared with the general population or with other chronic health conditions (George et al., 2007).

Psychosocial interventions for treatment of alcohol and drug problems cover a broad array of treatment interventions, which have varied theoretical backgrounds. They are



aimed at eliciting changes in the patient's drug use behaviors well as other factors such as cognition and emotion using the interaction between therapist and patient.

Objectives

1. To study the difference between the experimental group and control group of Alcohol Dependents on their post test scores after the intervention on their Alcohol Use Disorder Identification Test (i.e., treatment outcomes).
2. To study the difference between experimental group and control group on the Psychological domain of quality of life of the participants after the intervention.

Hypotheses

1. There would be a significant difference between the participants (alcohol dependents) of experimental group and control group on their post test scores of Alcohol Use Disorder Identification Test (i.e., treatment outcomes) after the intervention.
2. There would be a significant difference between the experimental group and control group on the post test scores of the Psychological domain of Quality of Life of the participants (alcohol dependents) after the intervention.

Methodology

The present investigation was designed to study the effectiveness of psychological intervention on alcohol dependents. The following methodology was used to test the hypotheses formulated.

Design of the Study

In the present study, Pre -Test and Post -Test Treatment design was used to study the effectiveness of Psychological Intervention on alcohol dependents and Treatment outcome (See Table1.1)

Table 1
Designs to study see the Effect of Psychological intervention on the Treatment Outcomes

	Pre- Test	Post Test
Experimental Group	21	21
Control Group	21	21

Tool of the study

In the present study, the following standardized tool was administered.

Alcohol Use Disorder Identification Test, AUDIT (Babor, et al., 2001)

The Alcohol Use Disorders Identification Test (AUDIT) was developed with the aim to identify hazardous and harmful use of alcohol use in primary health care. This is a five point Likert's Scale having 10 items in total comprising three domains of alcohol usage i.e., Hazardous use, Harmful use and Dependence symptoms ranges from 0 to 40 scores.



Reliability and Validity

The Alcohol Use Disorders Identification Test studies have reported to possess adequate internal consistency (Fleming, et al., (1991). A test-retest reliability study indicated high reliability ($r=.86$) in a sample consisting of cocaine abusers, and alcoholics (Sinclair, McRee, and Babor, 1992). According to Allen, et al., (1997) the scale has been found to have good internal reliability across these populations, with Cronbach alphas ranging from .80 to .94. A validation study performed by Pal et al., (2004) in India compared the AUDIT with the Short Michigan Alcoholism Screening Test (SMAST) and reported a very high internal consistency of AUDIT (Cronbach's $\alpha = 0.92$).

The World Health Organization Quality of Life-BREF (1998)

The scale 'BREF, 1998' developed by WHO, was used in the present study to measure the quality of life of alcohol dependents. The WHOQOL-BREF, contains total 26 items, includes two items on overall QOL and general health (Not used in the present study), while the remaining 24 items comprising four domains i.e., physical health. Psychological, social relationship and environment were taken in the present study.

Physical Health (Domain I), comprising 7 items, measure the quality of life Physical health such as Activities of daily living, Dependence on medicinal substances and medical aids, Energy and fatigue, Mobility, Pain and discomfort, Sleep and rest, Work Capacity.

Psychological (Domain II), comprising 6 items, measure the quality of life Psychological such as Bodily image and appearance, Negative feelings, Positive feelings, Self-esteem, Spirituality, Religion, Personal beliefs, Thinking, learning, memory and concentration.

Social Relationships (Domain III), comprising 3 items, measure the quality of life social relationship such as Personal relationships, Social support, Sexual activity.

Environment (Domain IV), comprising 8 items, measure the quality of life environment such as Financial resources, Freedom, physical safety and security, Health and social care: accessibility and quality, Home environment, Opportunities for acquiring new information and skills, Participation in and opportunities for recreation, leisure activities, Physical environment (pollution/noise/traffic/climate), Transport.

Scoring: Respondent gave their responses on a five point Likert scale ranging from 1 to 5 i.e., 1 stands for very poor/dissatisfied/not at all/Never, 2 for poor/dissatisfied/a little/Seldom, 3 for Neither poor nor good / Neither satisfied nor dissatisfied/Moderately/Quite Often, 4 for good/ satisfied/ very much (Often)/Mostly and 5 for very good/ satisfied/ extremely/ always. The items number 3, 4 and 26 are scored reversely. The Higher score indicates a higher quality of life along with its domains.



Reliability and Validity

The internal consistency between the four domains of the WHOQOL-BREF was found to be excellent (Cronbach's $\alpha=0.89$) among opium and alcoholic dependent subjects. The inter-domain correlations were found to be positive and significant between all pairs of the four domains using two tailed test at $P < 0.01$ (Pearson coefficient varied between + 0.62 to + 0.71 between the domain pairs). WHOQOL-BREF is a 26-item shorter version of the WHOQOL-100 which correlates at 0.9 with the WHOQOL-100 with good discriminant validity, content validity and test-retest reliability (WHO, 1998).

Procedure

In the first phase of the study, permission from the different authorities was obtained and then the tentative time schedule was developed in consultation with the authorities. A prior appointment was made with the authorities to discuss about aim and objective of the study and it was ensured the positive result of the study will be discussed with authorities (Documents attached).

At the outset, the rapport was established with the Participants of the study and they were briefed about the study tools and nature of the information it would yield. They were also briefed about anonymity and confidentiality of the whole process of the psychological intervention programme. After the proper agreement understanding with the patients, "Alcohol Use Disorder Identification Test" was applied on the alcohol dependents who came for the treatment in the addiction clinic/centre of Govt. Hospitals. Finally, 42 participants who gave their consent to participate in the study along with their wife and having age range of 25-35 years were selected for the study. After that 21 each in the experimental and control group were selected randomly and administered WHOQOL -BRIEF before and after the intervention.

In the Second phase of the study, Psychological Intervention Programme Module was developed following the lines of Group Treatment For Substance Use (Velasquez et al. (2001) and Treatment Approaches for Alcohol and Drug Dependence (Tracey, et al. 2005) for the alcohol dependents based on their observation on alcohol Use Disorder Identification test after taking two months rigorous training from National Institute of Mental Health and Neurosciences (NIMHANS). Then the psychological intervention programme was conducted for the experimental group in regular three times in a month for 45 minutes. Throughout six months for alcohol dependents (Annexure-5).

They were exposed psychological intervention programme through different modes i.e., lecture method, providing written material, group counseling, role play and group discussion and field activities. Besides, many topics related to alcohol dependence, harmful, high risk, social issue, relapse prevention were discussed and practiced with the participants.



Results and Analysis

The present study was designed to see Quality of life of alcohol dependents after Psychological intervention. The Pre-test and Post test design was used and the pre test was conducted on the participants (alcohol dependents) to assess the level of their alcohol dependency and quality of life of the participants (alcohol dependents). After that six month programme of psychological Intervention was organised with the Participants in the experimental group besides, the control group was interacted simultaneously but no special intervention was given to them. Further, the post test was conducted to assess the treatment outcomes and quality of life of the participants and the observation were analysed as below:

In order to see the treatment outcomes of the study analysis of covariance was applied on the pre test scores and post test scores of both the groups. To analyse the observation with Analysis of Covariance Certain assumptions need to be satisfied first, to apply the analysis of Covariance to the data observed. Firstly, to test the control on the independent variable i.e. whether there exist any difference between the participants of experimental group and control group on their pre test scores analyses was applied and the result was tabulated in Table 2.

The F value ($F = .024$) came out to be non-significant at .05 level of significance indicating no significant difference between experimental and control group on their pre test scores i.e., the independent variables and covariate are not different across the group and satisfied the assumption to apply Analysis of covariance.

Table 2.
The F Value Table Showing the Difference between the Experimental and Control Group on their PreTest Scores.

Source	Sum of Squares	Df	Mean square	F value
Groups(Pre test scores)	.595	1	.595	.024
Error	1009.810	40	25.25	
Total	13943.000	42		

Secondly to test the assumption of homogeneity of regression, the result of the analysis showed the F value ($F = .099$) non-significant at .05 level of significance (See Table 3) indicating no difference between the subject's effects on group time pretest and thus satisfied the assumption of homogeneity of regression to qualify to apply Analysis of covariance to test the significant difference between experimental group and control group on the dependent variable i.e., Post test scores of the participants with the covariate independent variable i.e., pre test

Table 3.
The F Value Table Showing the Difference between the Experimental and Control group to test the Homogeneity of Regression

Source	Sum of Squares	df	Means square	F value
Groups*(Pre test scores)	.031	1	.031	.099
Error	11.896	38	.313	
Total	8342.000	42		

Further, to see the difference between the experimental group and control group on the post test score of the participants on their treatment outcomes, the F value came out ($F = 188.89^{**}$ $p < .01$) to be significant at 0.01 level of significance (See table 4). The mean values of the post test score of the experimental group turn out to be 10.52 whereas for the control group, it is 16.71 (See table 5) revealing the significant difference between the experimental and control group on their treatment outcomes i.e., the participants of experimental group showed significant improvement on their alcohol dependency than the control group.

Table 4.
The F Value Table Showing the Difference between Experimental and Control Group on the Participants Scores in the Post Test

Source	Sum of Square	Df	Means Square	F value
Groups (Post test scores)	373.590	1	37.59	188.89**
Error	77.134	39	1.98	
Total	9162.000	42		

Table 5.
Mean Value table of the Participants of the Experimental and Control Group on their Alcohol Dependency after the Intervention in their Post test Scores

Variable	Mean Values (Post Test)	
	Experimental Group	Control Group
Alcohol Dependency	10.52	16.71

In order to apply analysis of covariance on the pre test scores and post test scores of Psychological Domain of quality of life of the Participants, besides satisfying the basic assumption of applying Analysis of covariance.



To Satisfy the assumption of the “control” on the independent variable i.e., pre test scores on the Psychological Domain of the Participants, Analysis of covariance was applied to see the difference between pre test scores in the experimental group and control group(See Table 6)

Table 6
The F Value Table Showing the Difference between the Scores of the Psychological Domain of the Participants in Experimental and Control group in the Pre Test

Source	Sum of Squares	df	Mean square	F value
Groups(Pre test scores)	3.094	1	3.094	.696
Error	177.906	40	4.448	
Total	6682.145	42		

The Table 6 showed F value($F=.696$) which is non-significant at .05 level of significance indicating no significant difference between experimental and control group on their pre test scores i.e., the independent variable and covariate that is outcome are not different across the group and satisfied the assumption to apply Analysis of covariance.

To test the assumption of homogeneity of regression, the result in the Table 7 showed the F Value($F= 2.394$) which is not significant at .05 level of significance indicating no difference between subject effects on group time pretest and thus satisfied the assumption of homogeneity of regression to qualify for analysis of Covariance to test the significant difference between experimental and control group on the dependent variable i.e., post test scores of Psychological Domain of the Participants with covariate independent variable i.e., pretest scores of the Psychological Domain of the Participants.

Table 7
The F Value Table Showing the Scores of Psychological Domain of Participants in the Experimental and Control Group to test the Homogeneity of Regression

Source	Sum of Squares	df	Mean square	F value
Groups* (Pre test scores)	7.901	1	7.901	2.394
Error	125.429	38	3.301	
Total	10672.378	42		

Now to see the difference between the experimental group and control group on the post test score of the participants in their treatment outcomes of the Psychological Domain of the Participants, the F value came out to be ($F= 183.81^{**}p<.01$) which is

significant at 0.01 level of significance showing significant difference between the groups on their post test scores (See Table 8) and the mean values of the post test score of experimental group(19.31)and control group (11.30) revealing the significant improvement on the Psychological Domain of Participants in the experimental group than the control group(See Table 9).

Table8
The F Value Table showing the Difference between Experimental and Control Group on the Psychological Domain of Participants in the Post Test

Source	Sum of Squares	df	Mean square	F value
Groups(Post test scores)	628.407	1	7.901	183.81**
Error	133.329	38	3.419	
Total	10672.378	42		

Table 9

Mean value Table of the groups on the Psychological Domain of the QOL after the Intervention

Variable	Mean Values (Post Test)	
	Experimental Group	Control Group
Psychological Domain	19.31	11.30

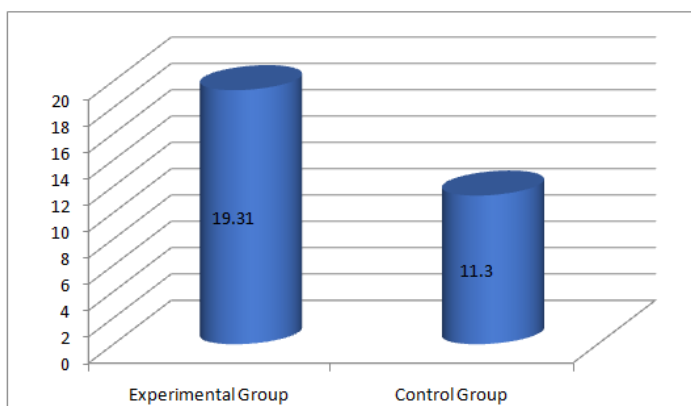


Fig. 1: The difference between the groups on the Psychological Domain of the QOL after the Intervention



DISCUSSION

In order to see the effectiveness of Psychological Intervention Programme on the Participants of the study, Analysis of Covariance (ANCOVA) was applied on the pretest and posttest scores of the experimental group and control group. The F value came out (188.89**) significant at 0.01 level of significance showing significant difference between the groups on their post test scores (See Table 4). Further, the mean value scores (See Table 5) on the post-test score of the participants of the experimental group (10.52) were lower than the participants of control group (16.71). Thus, indicated the significant improvement on the alcohol dependence usage of the participants of experimental group than the control group after the intervention. Hence, the **Hypothesis No.1 is accepted and stand confirmed i.e., “There would be a significant difference between the experimental group and control group of Alcohol Dependents on their post-test scores after the intervention on Alcohol Use Disorder Identification Test”.**

The result of the present study does find support in the light of earlier work done in the field of alcohol abuse. Amy O'Donnell et al., [3] studied Twenty-four systematic reviews of studied the impact of psychological intervention on alcohol dependents. Across the included studies, it was consistently reported that Psychological intervention was effective for addressing alcohol drinking problem and significant reduction in alcohol usage after the psychological intervention. Further, motivational interviewing focused to enhance the patient's intrinsic motivation so as to change their substance use by exploring and resolving ambivalence toward behavior change Miller et al., [14]. Riper [19] conducted a meta-analysis that revealed Cognitive behavioral therapy and motivational interviewing proved effective for treating subclinical and clinical alcohol use compared with controls. McQueen et al., [13] Brief interventions are often motivational in nature involve a time-limited intervention focused on changing behaviour using counseling skills so as to encourage a reduction in alcohol consumption. They also included fourteen studies involving 4041 male participants and demonstrated that patients receiving brief interventions have a greater reduction in alcohol consumption compared to those in control groups at six months.

In order to observe the effectiveness of Psychological Intervention Programme on Psychological Domain of quality of life of the of the Alcohol Dependents and the result of the Analysis of covariance (ANCOVA) applied on the data of the experimental and control group showed The F value In case of the Psychological Domain of the participants came out to be ($F=183.81^{**}$ $p < .01$) significant at 0.01 level of significance (See Table 8) and showed the difference between the post-test scores of the participants of the experimental and control group on their Psychological Domain of the quality of life after the psychological intervention. The mean values of the post-test score of the experimental group (19.31) is higher than the control group (11.30) revealing the significant improvement on the Psychological domain of the quality of life of the Participants in the experimental group than the control group (See Table 9), and indicating the better Psychological status of the participants of the experiment group than the control group after the psychological intervention.



The earlier studies do support the result of the present study. Andrade (2012) evaluated the effectiveness of naltrexone (medicine) 380 mg in combination with psychosocial intervention on alcohol dependence reported the significant improvements in their Quality of life, specifically in the domains of mental health, social functioning, general health, and physical functioning. Paul et al., (2011) conducted a study on the Quality of life of adult alcohol drinkers and intervention. After the group counseling programme of the drinkers significant improvement was noticed in their Psychological health-related quality of life. Kaplan, et al. (2012) found older drinkers who had reduced their alcohol intake, also reported improvement in their Quality of Life compared with alcohol drinkers in the same age range. The number of studies on Psychological intervention treatment to observed that the amount of alcohol consumption decreased is significantly related to the improvement in Quality of Life (Foster, et al., 1999; Donovan, et al., 2005; Connor, et al., 2006). Hence the hypothesis No 2.2 i.e., **“There would be a significant difference between the experimental group and control group of alcohol dependents on the post-test scores of their Psychological domain of Quality of Life after the intervention,”** is stands confirmed and accepted.

CONCLUSION: Thus, it can be concluded that there is need to consider the impact that alcohol use have on the quality of life of alcohol dependents. Alcohol Addicts face major problem based on prevalence of alcohol dependency That requires more attention and it is essential to design psychosocial intervention that aim at allaying their alcohol use problem and improving their quality of life .

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COST BENEFIT ANALYSIS OF TRANSMISSION SYSTEM CONNECTING PALLATANA GAS BASED POWER PROJECT (GBPP) AND BONGAIGAON THERMAL POWER STATION (TPS) NORTH EAST INDIA

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ABSTRACT

Pallatana GBPP & Bongaigaon TPS transmission system in the north eastern region of India is the second largest transmission project under the purview of the country's central transmission utility in India. The project is connecting the two major power generating stations of Assam and Tripura and also making further scopes for other generating hub in North Eastern Region (NER) to contribute their energy contribution to the National Grid to deal with the increasing power requirement in the whole country. This project is not only important for the POWERGRID but equally important for the 4.49 crore people of north eastern region states as well as the other states of India. This paper particularly focuses on the overall costs and benefit aspect of the transmission system with reference to Pallatana GBPP to Bongaigaon TPS.

Keywords: Pallatana GBPP, Bongaigaon TPS, POWERGRID, NER, transmission system.

INDIA'S NEW POWER HUB: NORTH EASTERN REGION

North eastern states are bestowed with all the natural beauties and the power of nature. The combined generating capacities of the seven states can fulfill the power requirement of above half of the population of India. As per an estimate by the Ministry of Power GOI, NER states possess the capacity to generate more than 50000 megawatt of power and beyond that also. Four private developers, namely KSK Dibbin Hydro Power Private Limited, Patel Hydro Private Limited, Adishankar Khuitam Power Private Limited and SEW Nafra Power Corporation Limited also entered in the generating areas of NER and also performing well. A total of 19 generation project developers have applied for connectivity or long term access to ensure that 11,500 MW is evacuated from the NER by the end of 12th plan or early 13th plan period. Apart from all other generating hub the main contributor to the national grid will be the power generators from the two major plants of NER i.e. Pallatana GBPP & Bongaigaon TPS. A transmission line between the two destination was proposed that will enable the two generating hub to contribute power to the national grid from which not only the seven states but the whole population of the states of India may be benefited.

PALLATANA GBPP

Power generation capacity in the North East has increased by almost 13% with



ONGC Power Tripura Company commissioning the first unit of the region's single largest 363 MW gas fired thermal project at Pallatana in Tripura near the Bangladesh border. ONGC's first project will cater to seven states in the region suffering from a power shortage. ONGC Power plant is planning to double plant capacity by adding one more unit to make Tripura the largest power producer in the region. ONGC is exploring possibility of commissioning 1.3 million tons of urea project at an investment of 5,000 crore in Tripura by 2017. The 726 MW project built at an investment of 3,804 crore. According to the state-owned firm, the power project combined with linked transmission project and upstream gas supply network has attracted investments of around 10,000 crore in the region. The project, initiated in 2005, has been delayed due to complications in project tendering and challenges in transporting the equipment in the hilly region. It was initiated to utilize natural gas locally as there was no local demand for it and it unable to monetize the same due to geographical limitations. At a time a majority of gas based power projects are ailing in the country, ONGC Power is confident that the Pallatana Project, which will receive fuel from ONGC at a firm price with extension of 4% a year over the long term, will help reduce the power crisis in the region.

BONGAIGAON THERMAL POWER STATION

National Thermal Power Corporation (NTPC) has set up 3x250 MW Bongaigaon Thermal Power Project in Bongaigaon, located at Kokrajhar District of Assam. According to the Detailed Project Report (DPR), the total land requirement is 964 acres. Out of this 210 acres will be used for ash deposit. No additional land will be acquired for the main plant; however an additional 50 acres of land will be acquired for railway siding. Water requirement is estimated at 3625 m³/hr to be obtained from Champamati River. The coal requirement is estimated as 3.19 million ton (MT) PA at 90% PLF and will be obtained from North Eastern Coal Fields Ltd and Eastern Coal field Ltd. Blended coal with average sulphur content of a 2% will be used as a fuel. It is also proposed to install FGD (Flu- Gas Desulphurization) based on wet time system with 90% efficiency of sulphur removal. The time requirement has been estimated as 2000 tons per day.

PALLATANA GBPP & BONGAIGAON TPS TRANSMISSION SYSTEM

The Pallatana GBPP (726 MW) of OTPC (ONGC Tripura Power Corporation) and Bongaigaon TPS (750 MW) of NTPC were planning to come up by the end of XI plan/early XII plan in the state of Tripura and Assam respectively. M/S OTPC has applied for long term open access for transfer of power from their Pallatana generation to the beneficiaries in NR & NER. Subsequently, Ministry of Power allocated the power from Pallatana Projects to the states of North Eastern Region. The project was commissioned in early 2012. The Bongaigaon TPS project was commissioned in August, 2010. The power from this Project is also allocated to the states of NER. In the view of beneficiaries, location and commissioning schedule of both the Pallatana and Bongaigaon generation projects, a combined transmission system for evacuation of power from both the projects has been planned along with strengthening of the inter-state transmission lines so that the states of NER can

absorb their requisites share from the projects. Transmission system of Pallatana GBPP and Bongaigaon TPS was finalized in the 6th TCC/NERPC meeting held on Aug 08, 2008 at Gurgaon and subsequent discussion with CEA and concerned states.

The proposed system would be executed by different utilities like POWERGRID, AEGCL (of Assam), MeSEB (of Meghalaya), TSECL (of Tripura), OTPC, NTPC and NETC (North East Transmission Company, JV of ILFS, Gov of Tripura, POWERGRID and other NER states). Subsequently, CEA vide its letter no. 89/4/2008/SP&PA dated 03.02.2009 has advised to include silchar-Srikona and silchar- Hailakandi 132KV D/cc lines under POWERGRID scope.

SCOPE OF WORK:

The scope of work covered under the project broadly includes the construction of following transmission lines, Substation and other associated works:

Sl.no.	Transmission Lines	Substations
1	BTPS- Bongaigaon 400KV D/C Line-3km	2x 200 MVA, 400/132KV New Substation at silchar.
2	Silchar – Badarppur (PG) Sw. Stn. Interconnecting 132 KV D/C Line-21km	2x50 MVA, 132/33KV New (GIS) at Meleriat New (upgradable to 400 KV)
3	Pallatana_ Surajmaninagar (TSECL) 400 KV D/c line (Charged at 132KV)-35km	2x50MVA, 132/33KV New Substation imphal upgradable to 400 KV
4	Silchar – Purba Kanchanbari (TSECL) 400 KV D/c Charged at 132 KV)-122km	220 KV New switching Substation at Mariani.
5	Silchar – Melriat (New) 400 KV D/c line Charged at 132 KV-160km	2x250MVA, 220/132KV New GIS at Mokuchung.
6	Melriat(New) – Melriat (Mizoram) interconnecting 132 KV D/c line-30km	2x15 MVA, 132 / 33 KV New Substation at roing.
7	Silchar – Imphal (New) 400 KV D/c line Charged at 132 KV)-140km	2x15 MVA, 132 / 33 KV New Substation at Tezu.
8	LILO of Loktak- Imphal (PG) 132 KV S/c line at Imphal (New)-6km	2x15 MVA, 132 / 33 KV New Substation at Namsai.
9	LILO of Kathalguri – Misa 400 bKV S/c line at-2km	Bongaigaon 400 KV S/s Extension.
10	Mariani (New) (charged at 220 KV)-56km	132 KV Badarpur (POWERGRID) S/S Extension.

11	Mokokchung (PG) – Mokokchung (Nagaland) 132 KV D/c line (with Zebra Conductor)-1km	132 KV Meleriat S/S Extension.
12	Pasighat – Roing 132 KV S/c line (on D/c Tower)-70km	132 KV Mokokchung Nagaland S/S Extension.
13	Roing – Tezu 132 KV S/c line (on D/c Tower)-60km	132 KV Ziro (POWERGRID) S/S Extension.
14	Tezu – Namsai 132 KV S/c line (on D/c Tower)-90km	123KV Pasighat GOAP S/S Extension.
15	Silchar-Srikona (AEGCL) 132 KV D/c Line-3km	132 KV Surajmaninagar (TSECL) S/S Extension.
16	Silchar – Hailakandi (AEGCL) 132 KV D/C Line-25km	132 KV Purba Kanchan Bari (TSECL) S/S Extension.
17	-	132 KV Srikona (AEGCL) S/S Extension.
18	-	132 KV Hailakandi (AEGCL) S/S Extension

PROJECT OBJECTIVES

The objective of the project is to provide reliable and combined transmission strength for evacuation of power from both the projects i.e. PALLATANA GBPP & BONGAIGAON TPS along with the strengthening of inter-state transmission lines so that the constituent states of NER can draw their requisite share from the projects. The target beneficiaries of this project are all the constituent states of NER except for step down transformers and downstream system (including proportionate charges for common facilities in substations) at various new substations for which is to be borne by the respective NER states. The transmission system associated with Pallatana GBPP & Bongaigaon TPS (under the scope of POWERGRID) is scheduled to be commissioned within 34 months progressively from the date of investment approval of the project.

BASIS OF COST ESTIMATE

The estimated cost of the project based on 1st Quarter 2009 prices Level works out to Rs 1958.59 including an Interest During Construction (IDC) of Rs. 141.82 crores. The above cost estimate is inclusive of Excise Duty @ 8.24% and CST @ 2% (as funding for supply of equipment is assumed to be done through Domestic sources. Custom Duty @ 18.624% along with handling charges @ 2% there on has been considered for GIS equipment in the estimate. F&I @ 8% have been considered in the estimate. Also Entry tax @ 4% has been considered in the state of Assam and Arunachal Pradesh.



MODE OF FINANCING

The project is proposed to be funded through POWERGRID's internal resources and through loan from domestic sources. For the total project, equity component (30%) is proposed to be met through POWERGRID's internal resources and loan component (70%) through Domestic sources.

Based on the assumptions, that the project is being financed from equity and the loan in the ratio of 30:70 and the equity component being released simultaneously along with the loan component, the interest during construction works out at RS. 141.82 Crores.

PROJECT FUNDING DETAILS OF PALLATANA GBPP & BONGAIGAON TPS TRANSMISSION SYSTEM:

LOAN COMPONENTS

LOANS	TOTAL (Rs.in Lakhs)
BOND XXXI	4408
BOND XXXIII	2017
BOND XXXIV	6839
BOND XXXV	6947
BOND XXXVI	8366
BOND XXXVII	8064
BOND XXXVIII	4682
BOND XXXIX	6000
SBI 11-12 & 12-13	5576
BOND XL	12932
BOND XLI	13142
BOND XLII	10847
TOTAL	89820

A total of eight hundred ninety eight crore and twenty lakhs has been raised from the market by issuing different types of bonds and via raising loans from SBI also.

PROJECT COST ESTIMATE

The estimated cost of the project based on 1st Quarter 2009 price Level is as follows:

Total Cost (Rs in Crores)	
Transmission System	
1816.77	
Interest During Construction(IDC)	141.82
TOTAL	1958.59

COMPLETION COST

The completion cost of the project is expected to be Rs 2261.54 crores including



Interest During Construction (IDC) of Rs 154.01 cr. The above cost has been based on the average movement of Wholesale Price Index (WPI) (80%) weightage and Consumer Price Index (CPI) (20%) weightage for the preceding 12 months period as per guidelines dated 06.08.1997.

The capital cost of the transmission system project includes; a) an equity components of 30 % and b) a loan component of 70%. The annual transmission charges comprises of return on equity, an interest for the loan components, depreciation charges, operation & maintenance (O&M) charges and interest on working capital as approved by Central Electricity Regulatory Commission (CERC) would be payable in fixed monthly charges by the beneficiaries. In addition to annual charges Income Tax, Foreign Exchange Rate Variation (FERV) and incentives etc. as per the notification would also be payable. In line of the POWERGRID's commercial policies, it is proposed to recover the transmission charges from the beneficiaries as per Notification in proportion to the benefits derived by them.

CONCLUSION

Pallatana GBPP & Bongaigaon TPS, Transmission system is the largest transmission project in NER and second largest Transmission project in the union of India. The project is benefitting the 4.49 crore people of North Eastern States touching almost 85 districts of the seven states, many villages and delivering a good service and acting as a ray of hope for the people of whole India to meet the energy requirement.

BENEFITS TO THE COMMON PEOPLE

The project is benefitting the whole people of NER states. It is covering the populated states of North east and meeting the energy requirement of the customer (Industrial and Domestic) both. In comparison to the earlier year the rate of the consumption of the electricity has increased at all levels. Development of the modern equipments, communications media such as mobile, other home appliances, electrical and electronic equipments etc usually run on the electricity and the uses of such devices and appliances has increased in recent years. Even a common people use mobile phones to communicate with his/her relatives living far flung. Hence it creates a huge dependency on electricity to meet our day to day work. At this point of time a transmission projects not only meets the needs and requirements of the common man but helps him to match his steps with the whole world.

Apart from the petty benefits the common man can have several other benefits from this particular transmission project some of them are mentioned below:

- ❖ Employment & Standard of Living: The Pallatana GBPP & Bongaigaon TPS transmission system went through seven states delivering employment and other

works to the local contractors and employing indigenous people of the NER and till date a number of works the POWERGRID is awarding to the people and the contractors of the NER states. Hence the whole project is helping the people to raise their standard of living.

- ❖ **Distributing & Redistributing of Income:** This particular project is a finest example that shows that a particular project should not accumulate income in a few hands. POWERGRID being the employer of the project help the common people to reap benefits from the particular projects by awarding a no. of works and paying huge taxes to the particular state government and the central government both.
- ❖ After the commissioning of the Pallatana GBPP & Bongaigaon TPS project the market value of the shares of the POWERGRID has shown a little increase and helping the investors to earn a good return on their investment.

BENEFITS TO THE NER STATES

The top most beneficiaries of the Pallatana GBPP & Bongaigaon TPS transmission system project will be the seven major states of the NER. According to the sources, the seven states will draw their shares from the particular transmission system at following rates:

STATES	SHARES
Assam	240 MW
Arunachal Pradesh	22 MW
Tripura	196 MW
Meghalaya	79 MW
Manipur	42 MW
Nagaland	27MW
Mizoram	22MW

Apart from that ONGC Tripura Power Company (OTPC) will keep 98 MW. These states have formed a transmission company in partnership with POWERGRID CORPORATION to evacuate the power. The Power requirement of the states will meet to some extent by the transmission project Pallatana GBPP & Bongaigaon TPS. If the generating station is located in the states of Arunachal Pradesh and Other NER states then a total of 12% of the total Power generation will be attributed to the State government free of cost.



CONNECTING LINK TO THE FUTURE POWER HUB

The Pallatana GBPP & Bongaigaon TPS transmission system had established a cobweb of transmission lines in NER and established a based for the future power hub of the north east to contribute to the National Grid as and when they started generating electricity. One of the Asia's largest Power Project LOWER SUBANSIRI HYDRO ELECTRIC PROJECT, under NHPC, KAMENG HYDRO ELECTRIC PROJECT under NEEPCO and several other power projects in NER states can contribute to the National Grid in future.

BENEFITS TO THE NEIGHBOURING COUNTRY

Under Pallatana GBPP & Bongaigaon TPS transmission system, POWERGRID has established two substations in BHUTAN One at Gelphu and another at Motongo which is delivering good services to the people of Bhutan. Being a Himalayan country blessed with good hydro potential the importance and the presence of Bhutan cannot be neglected. As on date Bhutan is selling more than 1200 MW of power to India and establishing substations in Bhutan does not only strengthen the relation between two countries but establishes a future scope to purchase power from Bhutan in near future. Broadly speaking, the Pallatana GBPP & Bongaigaon TPS transmission system is not only connecting Assam and Tripura but it is connecting the NER states to the whole of India. Every generating station located at NER states has to contribute their power share to the national grid that will contribute the whole country to develop a smart grid of POWER supply that will help energy monitoring and tackling power crises in the country. The dream of One nation one grid cannot be possible if we did not take NER transmission system into consideration.

BENEFITS TO POWERGRID

The commissioned assets of Pallatana GBPP & Bongaigaon TPS transmission system is generating good tariff for the whole corporation. The total of Rs 2261.54 crore projects is contributing its part to make successful the journey of a NAVRATNA company to MAHARATNA.

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COMPARATIVE STUDY OF CONCRETE USING BROKEN BRICKS, BROKEN MARBLES AND BROKEN TILES AS A FULL REPLACEMENT OF COURSE AGGREGATE

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Abstract

Concrete is among one of the most extensively utilized construction material. The unrefined resources from which it is primed are cement along with aggregate that mutually affects the quality of construction. Aggregate comprise more than 70% of volume and also the cost of construction is affected by the availability of these aggregates. From environmental point of view the mining of natural aggregates hinders the groundwater convenience. It also leads to atmospheric contamination by releasing dust and slurry particulates. This work shows an attempt to find the possibility of using broken bricks, broken marbles and broken tiles obtained from flooring works.

In this research various samples were made having broken bricks, broken marbles and broken tiles as a full replacement of coarse aggregates and corresponding workability and compressive strength has been checked and compared with natural coarse aggregate and found that sample having broken marble attains the highest compressive strength and same workability among all three waste materials.

Keywords: Broken Bricks, Broken Marbles, Broken Tiles, Compressive Strength, Workability

1. Introduction

Concrete consists of cementing material, aggregates, water and repeatedly controlled quantity of air entrained. Most of the concrete mix is formulated by coarse and fine aggregates. In this regard, gravel sand and compacted stone are utilized. Used aggregates are progressively more used as part or full substitution of natural occurring aggregates. Thus, by using recycled materials, concrete can be efficiently produced.

In broad-spectrum, every kind of mines do affect their nearby surroundings to a touch or additional level, particularly mining of marble, granite, lime stone, sandstone & other sort of building stone quarries, comes under open mining leads to multifaceted kind of troubles for instance drainage chock, dust trouble, slurry particulates becomes air born and create atmosphere contamination in form of air pollution, slurry causes land yielding because of porosity reduction, water inclusion and as a result, these dumped areas cannot provide growth to vegetation. Owing to enduring authentication of land slurry and the particulates obstruct the flow establishment of aquifers. Consequently,



gravels impact underground water accessibility thus demanding waste materials must be utilized eloquently economic.

Due to brisk growth of construction activity, the accessible sources of natural aggregates are getting worn out, thus, protection of natural resources are a great confront for civil engineers since construction activities cannot be reduced. The only way is to explore an alternative stuff which can fully or moderately replaced naturally existing material in construction.

In addition, with raise in population in recent decades which enhanced the concrete jungles (demand of more and more construction), the magnitude of incremental waste is a problem of grave concern. Such construction wastes can be utilized for manufacturing the low weight small expenditure RAC (Recycled Aggregate Concrete).

Objective of research:-

The main objectives of the study are:

1. Utilization of broken bricks, broken marbles and broken tiles by replacing natural aggregates in concrete to attain sustainable development of structural engineering by reducing consumption of natural resources.
2. To study and evaluate the workability as well as strength in compression of replaced concrete, from normal specimens.

2. Materials

2.1 Cement:

In this research work the cement used is Ordinary Portland cement (OPC grade 43)

Table.1. Properties of cement

S.no	Name of experiment	Normal range	Obtained range
1	Fineness of cement	Should not exceed 10%	10%
2	Standard Consistency Test	26%-33%	33.5%
3	Initial Setting time	minimum 30 minutes	95 minutes
4	Final Setting time	maximum 600 minutes	187 minutes

2.2 Fine aggregate:

For the experimental works sand is used as fine aggregate and through sieve analysis and grading limits it is observed that the sand sample is in zone III as per IS: 383-1970.

Table.2. Properties of sand

S.no	Name of experiment	Obtained Value
1	Fineness modulus of sand	4.05
2	Specific gravity of sand	2.6
3	Bulking of sand	3.66%



2.3 Coarse aggregate:

Coarse aggregate of nominal size 20mm is used.

Table.3. Properties of Coarse aggregate

S.no	Name of experiment	Obtained Value
1	Fineness modulus of aggregate	4.58
2	Water absorption test	1.95%
3	Aggregate Impact Value Test	12.7%
4	Specific gravity of aggregate	2.86
5	Flakiness Index	11.803%
6	Elongation index	21.967%

2.4 Broken bricks, broken marbles and broken tiles:

Broken bricks, marbles and tiles are obtained from a nearby site that has been annihilated. These waste materials were crushed manually into small pieces at lab. Those crushed marble, brick and tile that retained on IS 4.75mm sieve were used as coarse aggregate.

Table.4. Properties of Broken bricks, broken marble and broken tiles

S.no	Name of experiment	Obtained values
1	Specific gravity of broken bricks	1.92
2	Specific gravity of broken marble	2.71
3	Specific gravity of broken tile	2.32
4	Water absorption of broken bricks	13.5%
5	Water absorption of broken marble	0.85%
6	Water absorption of broken tile	0.3%

3. Methodology:

3.1. Mixing

Different samples of concrete cubes have been prepared with replaced coarse aggregate as broken brick, broken marbles and broken tiles. Concrete is prepared for M20 mix. In order to gain unvarying combination, the dried ingredients are meticulously mixed and a calculated quantity of water is added (W/C ratio) followed by fine mixing in order to get an unvarying texture.

3.2 Casting

Once the concrete mixture is formed, it is packed in the mould by the vibrator for complete removal of air. The apex of concrete is ceased with the help of trowel & sound tapping is done till the cement slurry comes to the cube peak.

3.3 Curing

Next day after casting, the cubes are detached from the mould and it is kept beneath

freshwater at a temperature maintained around 27 °C for 7 to 28 days, after every 7th day the water is changed.

3.4 Testing

Cubes of size 150 mm are tested for compressive strength in universal testing machine. The cubes are centrally positioned on the circle marks located in machine plate and axial load is applied on the cubes. The rate of application of this gradual loading is kept at 140kg/cm², till the cube collapses. The compressive load is defined as the utmost load at which the cube fails.

Compressive strength= Failure load per unit initial cross sectional area

4. Results and Discussion

Table.1 Compressive Strength of Different Samples Obtained from Test at 7, 14 and 28 days

S. no	Sample	Compressive Strength in KN/mm ² (MPa)		
		7days	14days	28days
1	Cement + sand + Coarse aggregate,S ₁	18.07	21.3	32.622
2	Cement + sand + broken bricks,S ₂	22.25	22.67	29.955
3	Cement + sand + broken marble,S ₃	24.04	26.31	33.76
4	Cement + sand + broken tiles,S ₄	21.90	24.67	31.35

Graph.1 Comparison of Compressive Strength of Concrete Cubes

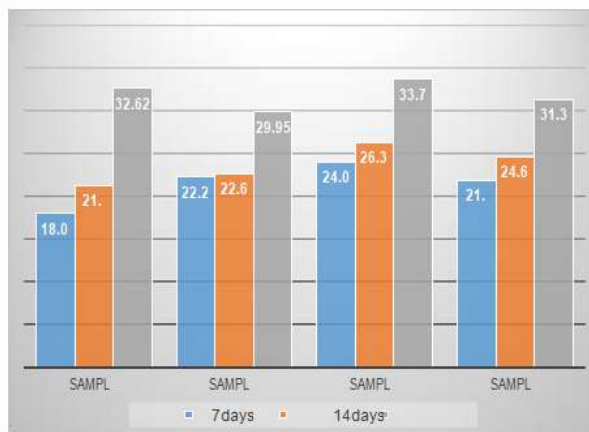




Table.2 Water- cement ratio and Concrete workability

Sl. no	Sample	w/c	Slump, mm
1	Cement + sand+ Coarse aggregate,S ₁	0.45	50
2	Cement + sand + broken bricks,S ₂	0.50	20
3	Cement + sand + broken marble,S ₃	0.45	45
4	Cement + sand + broken tiles,S ₄	0.45	42.5

5. Conclusion

1. Concrete mixes containing brick, marble and tile aggregate shows marginal increase in compressive strength in contrast to natural concrete.
2. The workability of all concrete mixes containing marble aggregate decreased as the percentage level of replacement of natural aggregates by brick, marble and tile aggregates increased.
3. It concludes that natural aggregate can be replaced by brick, marble and tile aggregates to a full extent in concrete mixes.
4. Reduction in issues like drainage chocking, dust trouble due to mining of natural aggregates and proper groundwater accessibility is achieved.
5. Atmospheric contamination resulted from mining is no longer a concern by using these aggregates.

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8. IS codes:

IS code:2386 part-3-1963 –(bulking of sand, specific gravity and water absorption test)

IS Code:2386 part-4-1963 – (aggregate impact value)

IS Code:4031-part-1-1996 – (Fineness of cement)

IS code 4031-part-4-1988 –(Normal consistency of cement)

IS Code 4031-part-5-1988 – (Initial and final setting time of cement)

IS Code -1199-1959 – (slump test of concrete)

ANTIBIOTICS RESISTANCE PATTERN IN DIFFERENT CLINICAL SAMPLES AT TERTIARY CARE HOSPITAL

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ABSTRACT

Background: Antimicrobial resistance is a serious problem worldwide and differs from region to region. This study was planned to determine the incidence and sensitivity pattern of *Klebsiella pneumoniae* (*K. pneumoniae*), *Escherichia coli* (*E. coli*) and *Pseudomonas aeruginosa* (*P. aeruginosa*) in our region and discuss the general issues related to antimicrobial resistance.

Methods: Prospective study was carried out between JAN to April 2020. Samples of urine, blood, pus, and miscellaneous samples (fluids, swabs, sputum and fluid) were collected from indoor patients for isolation and antimicrobial susceptibility of *K. pneumoniae*, *E. coli* and *P. aeruginosa* etc in different various samples the Department of Microbiology Narayana Superspeciality Gurugram.

Results: Out of the 315 samples analyzed 97 showed growth. In present study the highest percentage In present study, it has been demonstrated that different sample showing significant amount of antimicrobials Sensitivity to different antibiotics (Table 2). In present study, it has been demonstrated that different samples showing significant amount of antimicrobials Sensitivity to different antibiotics (Table 2). antimicrobials namely Meropenem (24.73), imipenem (25.77 %), ertapenem (16.49 %) and Gentamycin (24.73 %), amikacin (23.71%), ciprofloxacin (13%), Levofloxacin (8%), Colistin (14%).

Conclusions: The data indicates high resistance among the gram-negative bacteria for β -lactam and aminoglycoside antibiotics. Increasing resistance to doxycycline and fluoroquinolones for *K. pneumoniae* and *E. coli* and multidrug resistance to *P. aeruginosa* is a cause of concern in this region. Thus, there is a need to stop misuse of antibiotics with immediate effect and to implement a strong antimicrobial stewardship program.

Keywords: Antimicrobial Resistance, Gram-negative bacteria, Resistance, Stewardship

In current years drug resistance to human pathogenic bacteria is commonly reported throughout world (1,2)



In growing countries many communicable sickness have been correctly contained bacterial infections ,stay a major purpose of ,morbidity and mortality .Antimicrobial resistance nowadays well known as scientific and public fitness problem(3). It is a emerging issues in particular in health center and newly industrialized countries of Asia and pacific (4).Pharmacological industry have produced larges variety of newly antibiotics remaining three decades .

Gram-negative micro organism motive infections consisting of pneumonia, bloodstream infections, wound or surgical web page infections and meningitis in healthcare settings.Gram-negative micro organism are resistant to a couple of capsules and are more and more turning into resistant to most reachable antibiotics. These micro organism have built-in competencies to locate new approaches to be resistant and can ignore alongside genetic substances that permit different micro organism to grow to be drugresistant as well. Gram-negative infections encompass these prompted by using *Klebsiella pneumonia* (*K.pneumoniae*), *Pseudomonas aeruginosa* (*P.aeruginosa*), *Escherichia coli* (*E.coli*), *Acinetobacter* as nicely as many different much less frequent bacteria.

Pseudomonas aeruginosa is most difficult micro organism to deal with reistace to range of antibiotics .According National Nosocomial Surveillance facts from 1986-2003, *Pseudomonas aeruginosa* is a notably nosocomial pathogen. Other Study record enlarge in the share of resistant pressure in 2003 in contrast with 1998 , *Pseudomonas aeruginosa* contamination fee steady throughout this period(5). *Pseudomonas aeruginosa* is one of the vital bacterial pathogen remoted from many samples.

Escherichia coli (*E.coli*) , , the most universal facultative Gram-negative bacillus in the human fecal flora, normally inhabits the colon as an innocuous commensal. Theoretically the antimicrobials positive in opposition to *E.coli* are cotrimoxazole, fluoroquinolones, piperacillin, amoxy-clav, 0.33 technology cephalosporin's, carbapenems and aminoglycosides.3 Surveillance statistics exhibit that resistance in *E. coli* is persistently absolute best for antimicrobial dealers that have been in use the longest time in human and veterinary medicine.(6) *Klebsiella pneumonia* (*K.pneumoniae*) come to be a most essential pathogen in nosocomial contamination in latest yaers.Inindia and united states growing wide variety of gram poor cardio bacillary nonsocomial contamination (7,8). WHO warned all neighborhood of mutli drug resistant micro organism are emerging international massive assignment of healthcare, if immediately don 'take motion then solely handful antibiotic's will be left remedy illnesses (9)

Enterobacter cloacae have been pronounced as necessary opportunistic and multiresistant bacterial pathogens for people for the duration of the closing three many



years in health facility wards. *E. cloacae* and *E. hormaechei* are most often removed from human medical specimens. *E. cloacae* complicated are no longer understood yet; this should be due to the shortage and the dispersion of records available. Its capability to structure biofilms and to secrete a variety of cytotoxins (enterotoxins, hemolysins, pore-forming toxins) are vital for its pathogenicity(10)

Serratiamarcescens, a gram-negative bacillus categorised as a member of the Enterobacteriaceae, has been recognized as a reason of hospital-acquired contamination for the ultimate two many years. *S. marcescens* used to be viewed in the beginning to be an innocuous, non-pathogenic saprophytic water organism and was once often used as an organic marker due to the fact of its without problems known pink colonies. The first description of nosocomial contamination brought about by using *S. marcescens* was once Wheat's record of eleven instances over a 6-month length in 1951 at Stanford University Hospital(11)

Salmonella typhi (*S. typhi* Enteric fever, a systemic contamination triggered by means of *Salmonella typhi* (*S. typhi*) and *Salmonella paratyphi* (*S. paratyphi*), is a foremost chronic international fitness trouble and is predominantly pronounced in the growing countries. (12) About 22 million new instances of enteric fever with 200,000 mortality instances per 12 months have been stated worldwide(13) *Acinetobacter baumannii* The genus *Acinetobacter* involves of non-motile gram-negative coccobacilli bacteria. The colonies are 1 to 2mm, non-hemolytic, mucoid, easy and spherical on sheep's blood agar after 24 hours of incubation at 37°C (14,15,16)

(Methicillin-resistant *Staphylococcus aureus* (MRSA) has been removed and identified greater than 50 12 months ago. MRSA is a precise pressure of the *S. aureus*, which is resistant to methicillin and all β -lactams. Later use of Oxacillin as an choice to methicillin in susceptibility assessments resulted in the time period 'Oxacillin-resistant *S. aureus*' (ORSA) (17), which is resistant to several antibiotics. Before the improvement of antibiotics, invasive infections prompted with the aid of *Staphylococcus aureus* have frequently been deadly (18).

Candida species are the essential purpose of superficial to systemic fungal contamination in people and the important supply of contamination in fitness care facilities (19). *C. albicans* is the fundamental pathogenic agent of systemic infections, however, for the duration of the current years, the charge of non *albicans* *Candida* species has accelerated in many reports(20,21,22)

Enterococcus faecalis and *Enterococcus faecium*



Enterococci reason large infections, together with intraabdominal sepsis, urinary tract infections, bacteremias, and endocarditis. These gram-positive organisms are inherently resistant to more than one antibiotics, together with polymyxins, lincosamides, and trimethoprim-sulfamethoxazole, and have decreased susceptibility to phone wall-active sellers such as P-lactams and vancomycin (23)

Klebsiella oxytoca *Klebsiella oxytoca* (*K. oxytoca*) is a Gram-negative pathogen, cylindrical rod shaped, non-motile in nature, and belongs to Enterobacteriaceae family. *Klebsiella* spp. are ubiquitous in environment(24) *K. oxytoca* is now identified as vital medical pathogen in hospitalized sufferers inflicting main nosocomial infections in youth and neonates(25)

Proteus mirabilis From the scientific factor of view, *P. mirabilis* is the most essential *Proteus* species. It has been described considerably with the aid of Hauser already in 1885(26) and is regarded to purpose a large spectrum of human diseases, in particular in the hospitalized patient. It bills for about 3% of nosocomial infections in the United States(27)and ranks 1/3 as the reason of trouble-free cystitis, pyelonephritis and prostatitis(28)

Material and method = Sample collection

This study was conducted at the department of Microbiology in tertiary care hospital During jan-2020 to April 2020,differnet types of clinical specimens Such as blood, urine , pus, swab etcrecevid from inpatient .antimicrobial suspectibility pattern of *Klebsiella pneumonia* (*K.pneumoniae*), *Pseudomonas aeruginosa* (*P.aeruginosa*), *Escherichia coli* (*E.coli*), *Acinetobacter* from jan-2020 to june 2020 and these analyzed and reported. identification of bacteria

The bacteria were cultured on MacConkey's agar, Nutrient agar, blood agar and other selective media followed by the identification of the isolates based on their cultural characteristics, gram staining, motility and reactions in standard biochemical tests. Antimicrobial agents

All the isolates were tested for antimicrobial susceptibility by the Kirby-Bauer disk diffusion technique on Muller Hinton Agar by Filter Paper disks impregnated with antibiotics (Span diagnostics limited, Surat, India). A pre-diffusion time of 30 min was allowed at room temperature and the plates were incubated at 37°C for 24 h. The diameter of the zone of inhibition was measured and compared to that of standard strain and the results were interpreted as sensitive, or resistant, based on Clinical Laboratory Standard Institute 2014 guidelines.29

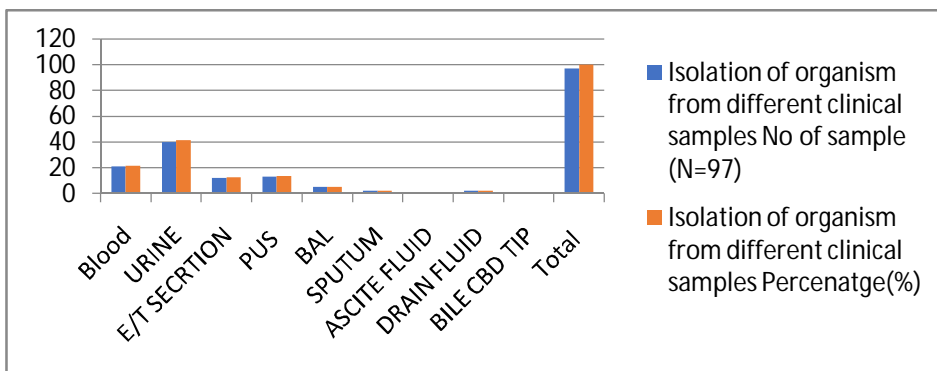
The percentage antimicrobial susceptibility of the isolated microorganism against different antimicrobials tested was calculated and interpreted as sensitive and resistant

Result and Discussion=During this study total sample collect 315 , A total 97 organism were isolated from 315 all sample in the present study the highest percentage shown in urine (41.23%) , and then 21% in blood

Table =1

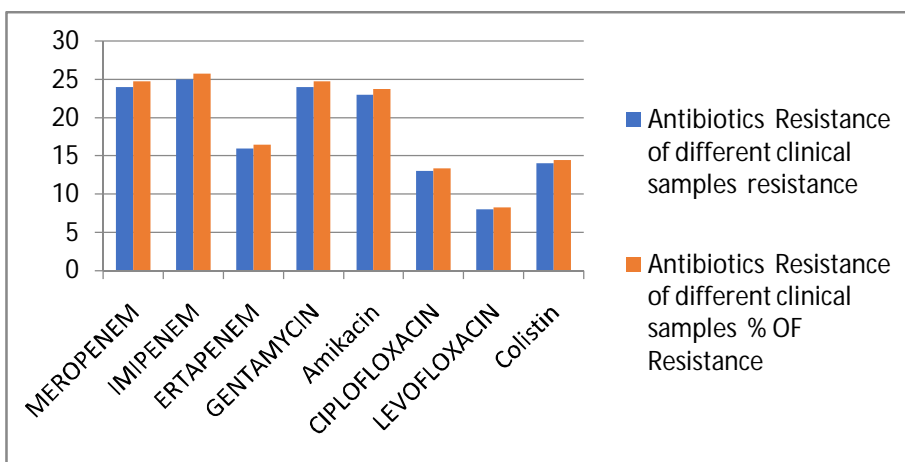
Isolation of organism from different clinical samples

Nature of sample	No of sample (N=97)	Percentage(%)
Blood	21	21.64948454
URINE	40	41.2371134
E/T SECR TIO N	12	12.37113402
PUS	13	13.40206186
BAL	5	5.154639175
SPUTUM	2	2.06185567
ASCITE FLUID	1	1.030927835
DRAIN FLUID	2	2.06185567
BILE CBD TIP	1	1.030927835
Total	97	100



Antibiotics Resistance of different clinical samples

ANTIBIOTICS	resistance	% OF Resistance
MEROPENEM	24	24.74226804
IMIPENEM	25	25.77319588
ERTAPENEM	16	16.49484536
GENTAMYCIN	24	24.74226804
Amikacin	23	23.71134021
CIPLOFLOXACIN	13	13.40206186
LEVOFLOXACIN	8	8.24742268
Colistin	14	14.43298969



In present study, it has been demonstrated that different samples showing significant amount of antimicrobials Sensitivity to different antibiotics (Table 2). antimicrobials namely Meropenem (24.73), imipenem (25.77 %), ertapenem(16.49 %) and Gentamycin (24.73 %), amikacin(23.71%), ciprofloxacin(13%), Levofloxacin(8%), Colistin (14%).

Discussion

A total 97 organism were isolated from 315 all sample in the present study the highest percentage shown in table 1 urine (41.23%) , and then 21% in blood , Sample isolated of urine , blood, pus, etc.



So the present study was conducted to determine the antibiotic sensitivity pattern isolated from various clinical samples. In present study imipenem show the highest Resistance 25 %, .

The antimicrobial agents are losing their efficacy because of the spread of resistant organisms due to indiscriminate use of antibiotics, lack of awareness, patient non compliance and unhygienic condition. It is the need of the time that antibiotic policies should be formulated and implemented to resist and overcome this emerging problem. Every effort should be made to prevent spread of resistant organisms.

Conclusion

To conclude, present study helped us to see the reality of antibiotic sensitivity pattern of bacteria in our region which is not good. And seeing the pace of new antibiotic development, immediate steps must be taken to curtail the problem of antibiotic resistance, otherwise it will take no time for us to move to pre-antibiotic era which would be a huge step back for human community.

ACKNOWLEDGEMENTS

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Studies on media formulation and optimization of cultural conditions for the production of CMCase by a catabolite repression resistant mutant strain of *Pseudomonas* sp (PsCCRRNT₉)

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Abstract

A cellulase producing catabolite repression resistant mutant strain of *Pseudomonas* sp. (PsCCRRNT₉) exhibited significant amounts of CMCase in a reported medium III. The composition of the medium which supported maximum CMCase production among all the tested reported media was further improved. A total of three media were formulated by changing the composition of the best production medium. Media containing CMC as the sole carbon source were also developed. The results showed that a significant increase of cellulase yield was achieved by employing a newly formulated production medium and optimized cultural conditions.

Keywords: Cellulase producing catabolite repression resistant mutant strain / *Pseudomonas* sp. / PsCCRRNT₉ / reported media / formulated media.

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Introduction

Cellulase is a multicomponent enzyme system including endoglucanases [EC 3.2.1.4], cellobiohydrolases [EC 3.2.1.91], 1,4-B-D-glucan glucanohydrolase [EC 3.2.1.74] and β -glucosidases [EC 3.2.1.21]. Endoglucanases / CMCases are considered to be important components of the system as the enzyme action is generally initiated by random acting endoglucanases at amorphous regions within cellulose chain to produce cello oligosaccharides. Microbial cellulases are in demand because of their potential ecofriendly applications in textile^{1,2}, detergents^{3,4} and pulp and paper industries^{5,6,7}. As the characteristics of producing strains change continuously, the fermentation process and fermentation media have to be updated continuously to meet the demands of the producing strains. The medium optimization and growth conditions are considered to be important aspects in the development of fermentation technology in order to increase the yield that would exploit the potential productivity of the organism⁸. The optimization of fermentation conditions particularly physical and chemical parameters are of paramount importance in the development of any fermentation process owing to their impact on the economy and practicability of the process⁹.

In the present investigations, therefore, an attempt was made to exploit the potential of CMCase producing ability of a catabolite repression resistant mutant strain of *Pseudomonas* sp. (PsCCRRNT₉) by developing a suitable production medium and optimization of cultural conditions.



Materials and Methods

Microorganism: A catabolite repression resistant mutant strain of *Pseudomonas* sp. (PsCCRRNT₉) developed through mutagenesis was used in the present study. It was grown on Luria-Bertani (LB) agar slants at 28±2°C for 48 hours and stored under refrigeration for further use.

To study the cellulase production by PsCCRRNT₉ in submerged fermentation, different media were employed¹⁰⁻¹⁵. Fermentation experiments were run with 45ml of each of the media in 250ml Erlenmeyer flasks. 10% (V/V) level of inoculum was used to initiate the growth and the inoculated flasks were kept on rotary shaker (150 rpm) at 28±2°C, for 24 hours. At the end of incubation period 5ml culture broth was withdrawn, centrifuged at 8000 rpm for 15min and the supernatant was assayed for CMCase activity.

Assay : Endoglucanase or carboxymethyl cellulase (CMCase) activity was assayed as described previously¹⁶. The release of reducing sugars was determined by dinitro salicylic acid (DNS) method¹⁷. One unit of endoglucanase or CMCase activity was defined as the amount of enzyme releasing 1μ mole of reducing sugar per ml per min.

Estimation of biomass : The culture broth was centrifuged at 8000 rpm for 20min and a clear supernatant was filtered through pre-weighed Whatmann No.1 filter paper. The filter paper containing the biomass was dried at 80°C for 48 hours or to get constant weight and its dry weight was estimated.

Statistical Analysis : Values are mean of three replicates significant at $p < 0.001$ according to Fisher's one way analysis. Later the means were compared with each other following Fisher's protected least significant difference test L.S.D (at $p \leq 0.01$ and $p \leq 0.05$).

Results and Discussion

The results pertaining to the composition and production of CMCase in different reported and formulated media were presented in table 1. A critical perusal of table 1 reveals that among different reported media, medium III¹² supported significant amounts of CMCase (3.92 U/ml) ($P < 0.05$) by PsCCRRNT₉ strain. Chaudhary *et al.*¹⁸ and Narasimha *et al.*¹⁹ reported the production of cellulase by mutants of *Trichoderma reesei* and *Aspergillus niger* on different media.

In order to further enhance the cellulase production, a total of three different production media were formulated by changing the composition of medium III which was found to be the best production medium. Production of CMCase on these three formulated media was investigated and the results are presented in table 1. It is evident from the table 1 that out of three different formulated media employed (i.e medium, VII; medium, VIII and medium IX) medium VIII supported significant amounts of CMCase (4.85 U/ml) at $P < 0.01$. Sukan *et al.*²⁰ demonstrated that emulsification of Tween 80 led to higher cellulase activities presumably by causing increased permeability of cell membranes and promoting the release of cell-bound enzymes. Shi *et al.*²¹ also

reported that through employing Tween 80 as a surfactant an enhanced cellulase production was observed. Similar results are obtained in the present study.

Studies on the influence of cultural conditions revealed that cultural parameters play a significant role in cellulase production. Cellulose yields appear to depend on a complex relationship involving a variety of factors like inoculum size (carbon source and cellulose quality), pH, temperature, presence of inducers, medium additives, aeration and growth time etc.²². In an effort to optimize the conditions for maximum production of enzyme, the effect of cultural conditions on CMCase production by PsCCRRNT₉ was investigated and the results are presented in fig 1, 2, 3, 4 and 5.

A critical analysis of fig 1 reveals that the pH of the growth medium plays a pivotal role by inducing morphological change in the organism and in enzyme secretion. PsCCRRNT₉ exhibited maximum CMCase of 4.69 U/ml significant at $P < 0.01$ and a biomass of 1.41 mg/ml ($P \leq 0.05$) at pH 7.5. Chen *et al.*²³ in their studies found that maximum CMCase activity by *Sinorhizobium fredii* was achieved at a pH 7.0.

Maximum CMCase activity (4.66 U/ml) and highest biomass (1.09 mg/ml) was attained at a temperature 50°C (fig-2) ($P < 0.05$). It indicates that the isolate PsCCRRNT₉ is a thermotolerant strain. The optimum temperature for CMCase activity by a catabolite insensitive mutant strain of *Bacillus pumilus* (BPCRI 6) was at 50°C¹⁴. The optimum temperature for cellulase production by *Cellulomonas* sp., *Bacillus* sp and *Micrococcus* sp was found to the 40°C²².

Results presented in fig.3 show that maximum CMCase production was attained at 48 hours of incubation period. A CMCase of 4.32 U/ml and a biomass of 1.31 mg/ml significant at $P \leq 0.01$ was recorded by PsCCRRNT₉. Swaroopa Rani *et al.*²⁵ observed a maximum cellulase activity at 48 hours in *Clostridium papyrosolvens* CFR – 703.

Among different cellulosic substrates, highest CMCase and biomass production was attained when CMC was employed as a substrate (Table 1). PsCCRRNT₉ exhibited maximum CMCase activity 4.68 U/ml and a biomass 1.32 mg/ml ($P \leq 0.05$). The effect of different concentrations with a range of 0.5 – 3.0% of CMC on cellulase production was investigated and the results are presented in fig 4 . The results reveal that CMC at a concentration of 2% is found to be ideal for cellulase production. A CMCase of 4.81 U/ml and a biomass of 1.34 mg/ml ($P \leq 0.05$) was recorded by PsCCRRNT₉. The present results are similar to Paul and Varma²⁶ and Ekperigin²⁷ observations.

Nature of nitrogen source in media is an important factor that affects enzyme production. A critical perusal of table 2 reveals that among different nitrogen sources investigated, NH₄Cl was found to be superior for PsCCRRNT₉. In presence of NH₄Cl, significant amounts of CMCase 4.59 U/ml and a biomass, 1.29 mg/ml was recorded at $P \leq 0.05$. Maximum CMCase production was observed at a concentration of 0.25% of NH₄Cl (fig. 5). At 0.25% of NH₄Cl maximum CMCase production by PsCCRRNT₉ was 4.92 U/ml ($P \leq 0.01$) and a maximum biomass of 1.24mg/ml significant at $P \leq 0.05$. Shiang *et al.*²⁹ reported that ammonium chloride was a preferable nitrogen source for the production of cellulase for *Acidothermus cellulolyticus*.



Based on these studies, we conclude formulated medium VIII is a suitable production medium for cellulase production for the strain (PsCCRRNT₉). The optimum cultural conditions i.e pH 7.5; temperature, 50°C; incubation period, 48 hours; CMC at a concentration of 2% and NH₄Cl at a concentration of 0.25% were found to be ideal for significant amount of CMCase production by a catabolite repression resistant mutant strain of *Pseudomonas* sp (PsCCRRNT₉).

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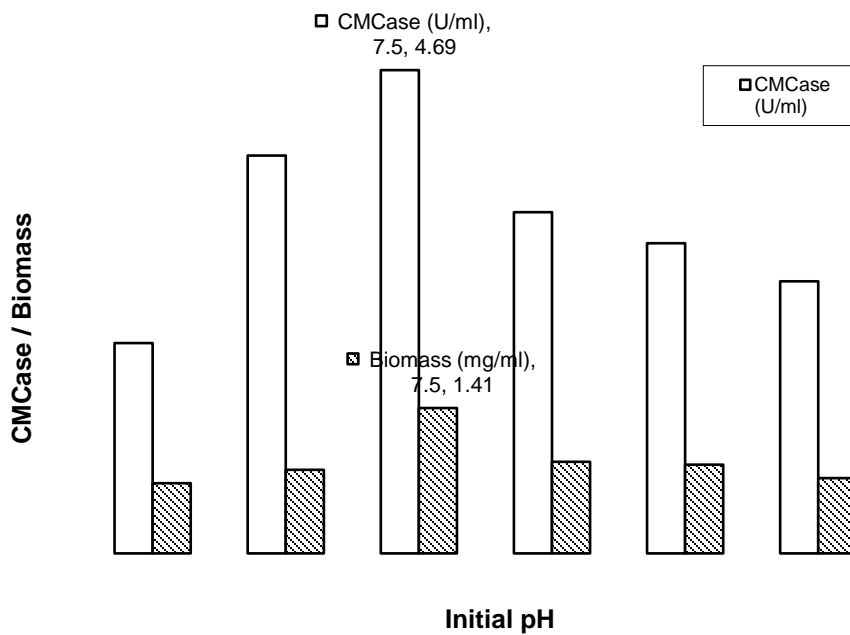
Table I : Composition of different media for CMCase production by PsCCRNT₉ strain

Reported Media	Composition (g/l)	Reference	CMCase activity*
I	Sucrose, 30.0; NaNO ₃ , 2.0; K ₂ HPO ₄ , 1.0; MgSO ₄ , 0.5; KCl, 0.5; FeSO ₄ , 0.01; CMC, 0.5%	10	3.71
II	CMC, 10.0; Peptone, 2.5; KH ₂ PO ₄ , 1; MgSO ₄ , 0.5	11	3.78
III	KH ₂ PO ₄ 2; (NH ₄) ₂ SO ₄ , 1.4; CaCl ₂ .2H ₂ O, 0.3; MgSO ₄ .7H ₂ O, 0.3; Urea, 0.3; Proteose peptone, 0.25; Yeast extract, 0.2; Cellulose (or) CMC, 10; trace-metal solution, 1ml; tween-80 1ml	12	3.92
IV	NH ₄ NO ₃ , 0.001; K ₂ HPO ₄ , 0.2; NaH ₂ PO ₄ , 0.5; MgSO ₄ .7H ₂ O, 0.2; FeSO ₄ .7H ₂ O, 0.01; CaCl ₂ , 0.01; Cellulose, 20; trace metals such as Mn, Mo, Cu, Co and Zn were added as 0.1 mg/l each	13	3.81
V	Glycerol, 2; CMC or cellobiose, 2; tryptone, 10; K ₂ HPO ₄ , 1; MgSO ₄ , 0.75; NaCl, 0.75;	14	3.74
VI	(NH ₄)HPO ₄ , 0.5; K ₂ HPO ₄ , 3 KH ₂ PO ₄ , 2; Yeast extract, 1; Peptone, 5; MgSO ₄ .7H ₂ O, 0.5; CaCl ₂ .2H ₂ O, 0.1; appropriate amounts of CMC, surfactants	15	3.69
Formulated media	Composition (g/l)		CMCase activity*
VII	KH ₂ PO ₄ , 0.75; CMC 10; MgSO ₄ .7H ₂ O, 0.5; CaCl ₂ .2H ₂ O, 0.1; Proteose peptone, 0.5; Yeast extract, 0.5; trace metal solution, 0.5ml		3.28
VIII	CaCl ₂ . 2H ₂ O,0.25; (NH ₄) ₂ SO ₄ , 0.2; MgSO ₄ .7H ₂ O, 0.3; KH ₂ PO ₄ , 1; Proteose peptone, 0.3; Urea, 1.0; Yeast extract, 1; CMC, 20; trace metal solution, 1ml; Tween-80, 0.05%		4.85
IX	KH ₂ PO ₄ , 1.5; CMC, 15; Yeast extract, 0.25; Proteose peptone, 0.1; (NH ₄) ₂ SO ₄ , 1; trace metal solution, 1.5ml		3.21
	LSD at 0.05		0.56
	at 0.01		0.81

* Carboxymethyl cellulases (CMCase) is expressed in terms of units. One unit is the amount of enzyme releasing 1 μmole of reducing sugar from carboxymethyl cellulose per min.

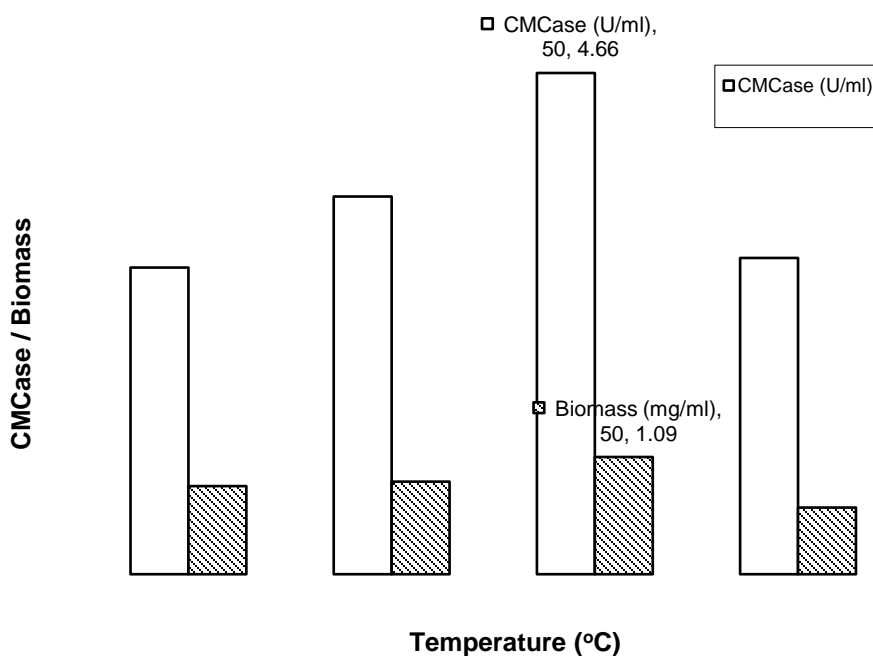
Values are mean of three replicates, significant at $p < 0.05$ according to Fisher's one way ANOVA analysis.

Fig. 1 : Effect of initial pH on CMCase activity by PsCCRNT₉ strain



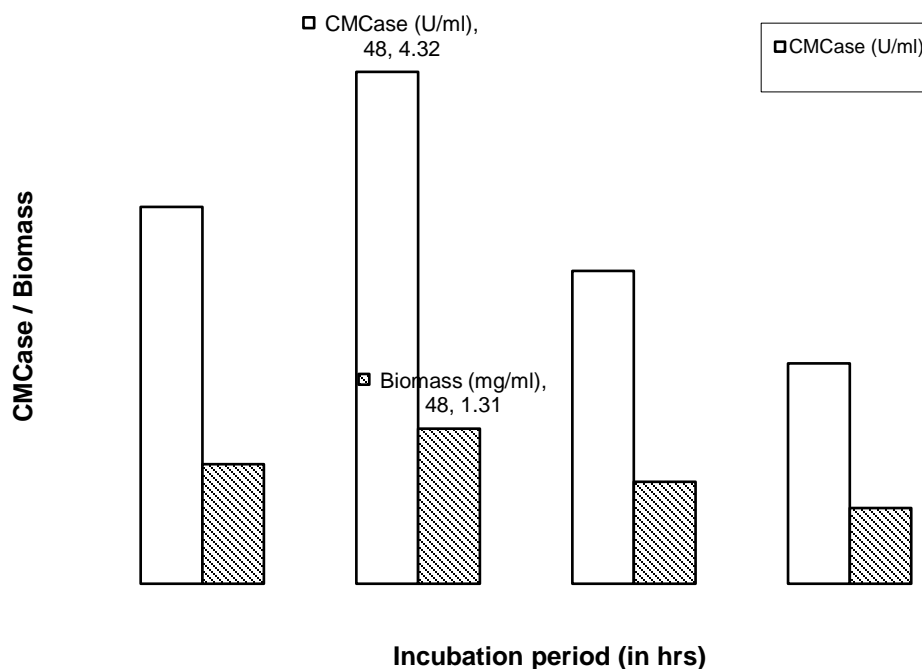
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Fig. 2 : Effect of temperature on CMCase activity by PsCCRNT₉ strain



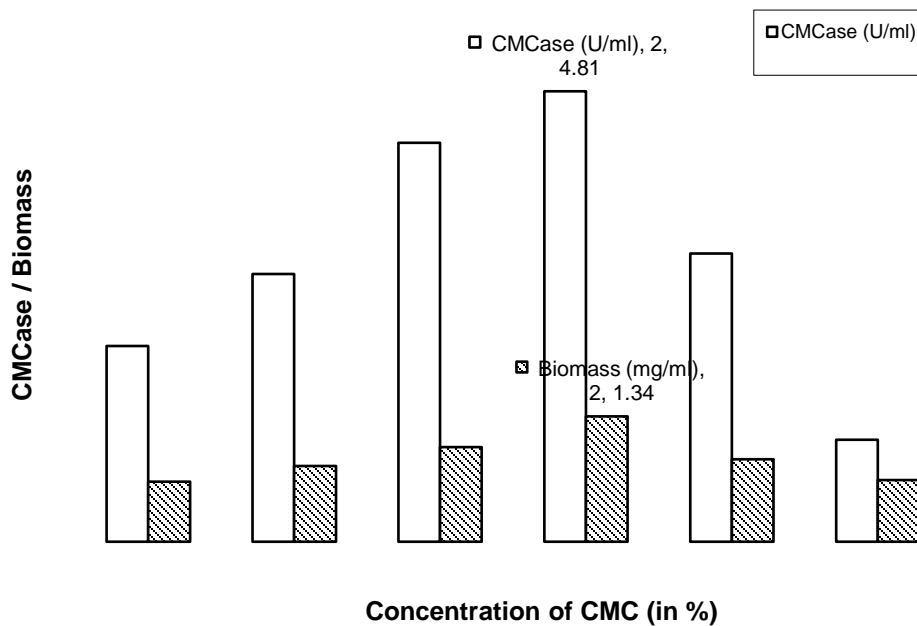
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Fig. 3 : Effect of incubation period on CMCase activity by PsCCRNT₉ strain



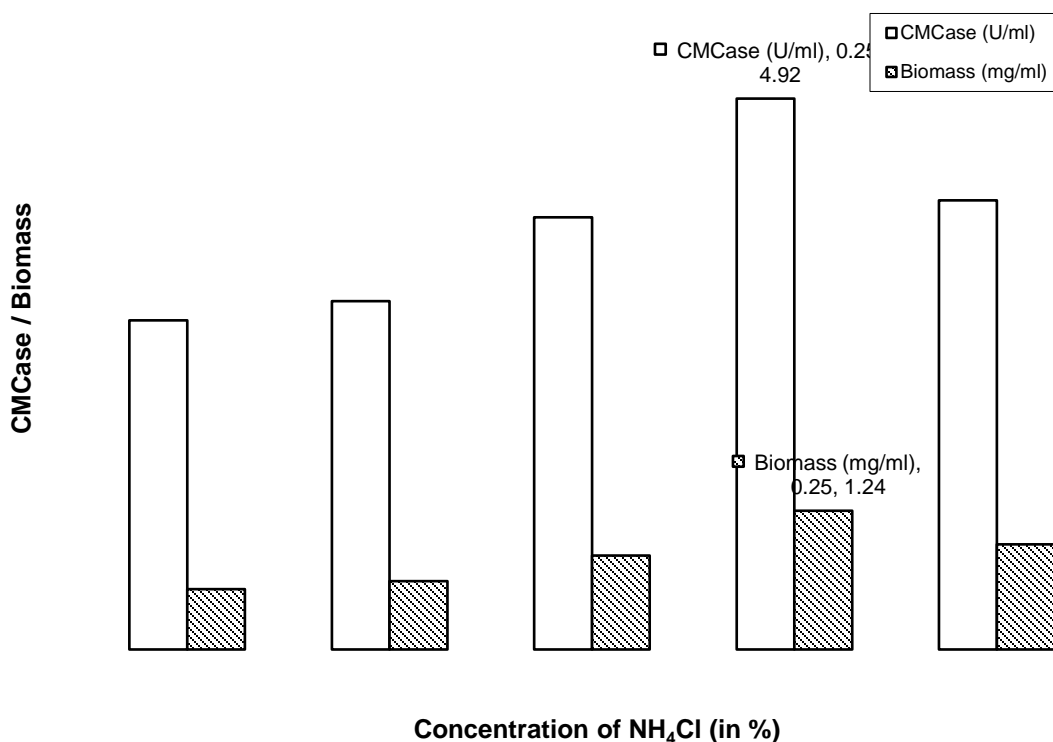
Values are mean of three replicates, $p < 0.001$ according to Fisher's one way

Fig. 4 : Effect of various concentrations of CMC to determine the optimum concentration for production of CMCase activity by PsCCRNT₉ strain



Values are mean of three replicates, $p < 0.001$ according to Fisher's one way

Fig. 5 : Effect of various concentrations of NH_4Cl to determine the optimum concentration for production of CMCase activity by PsCCRNT₉ strain



Values are mean of three replicates, $p < 0.001$ according to Fisher's one way ANOVA analysis

Table 3 : Effect of different nitrogen sources on production of CMCase by PsCCRNT₉ strain

Nitrogen sources	CMCase (U/ml)	Biomass (mg/ml)
KNO ₃	3.36	1.08
(NH ₄)NO ₃	2.64	0.73
NH ₄ Cl	4.59	1.29
(NH ₄) ₂ SO ₄	3.16	1.04
(NH ₄)HPO ₄	3.04	0.91
Yeast extract	2.69	0.81
Urea	2.04	0.58
Proteose peptone	2.98	0.81

LSD at 0.05	0.65	0.21
at 0.01	0.91	0.30

* carboxymethyl cellulase (CMCase) is expressed in terms of units. One unit is the amount of enzyme releasing 1 μ mole of reducing sugar from carboxymethyl cellulose per min

Values are mean of three replicates, significant at P<0.001 according to Fisher's one way ANOVA analysis