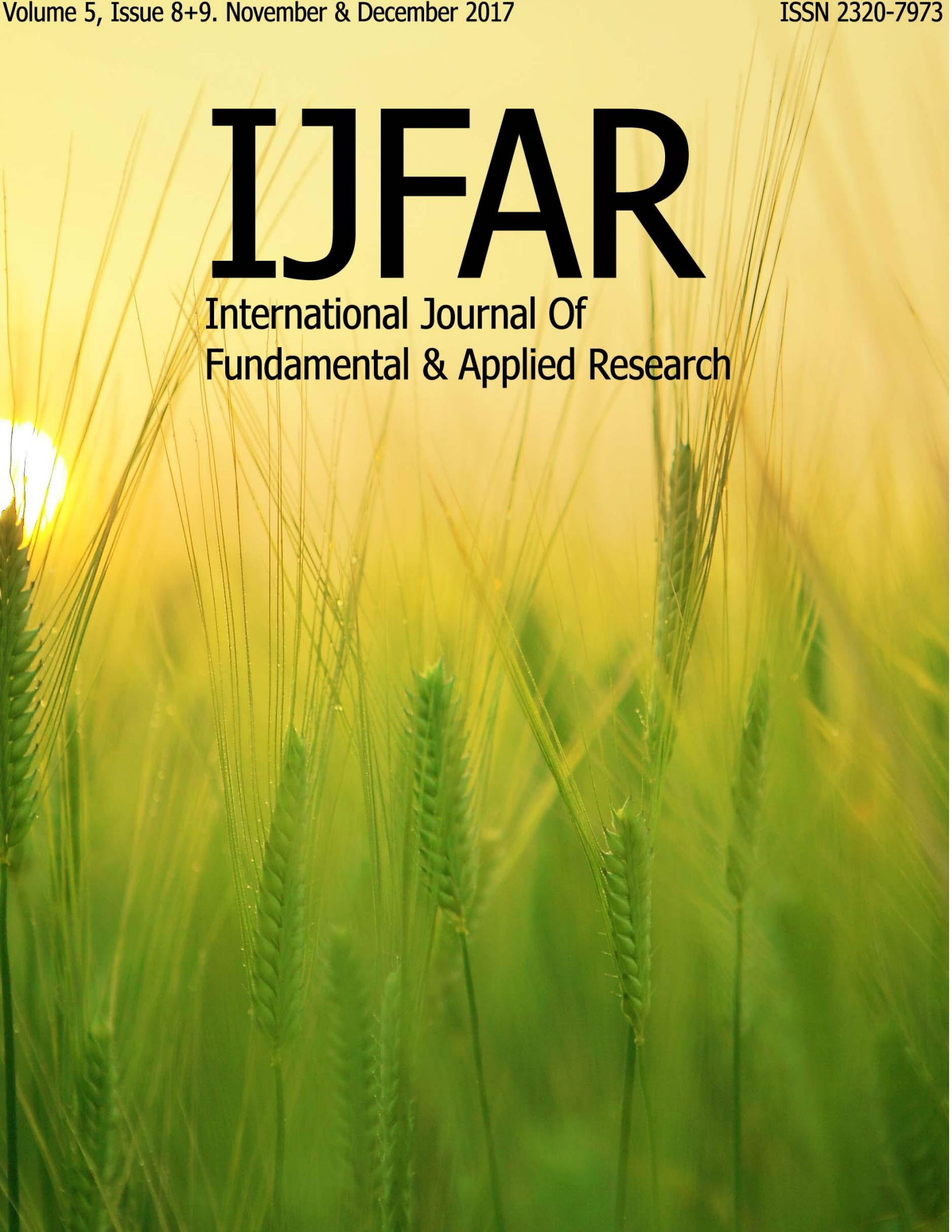


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Estimating Morphometric Parameters of Drainage System Present in Bhopal Planning Area using Remote Sensing and Geographic Information System

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ABSTRACT

An attempt to estimate and calculate drainage morphometric parameters of Bhopal planning area covering 147 villages is made to understand and divulge the application of remotely sensed data and Geographic Information System (GIS) in this regard. Present area is extended over 608.31 km². Methodology for the study includes delineation of streams using Survey of India toposheet and satellite image and are further analyzed using GIS platforms. Streams up to 4th order are identified in the study area. Aerial aspect and linear aspects of the area is calculated using stream characteristics like stream number, stream order, basin area, basin length etc. Result of this estimation show that the stream is a IV order stream, the mean bifurcation ration is 2.25 is suggestive of human interventions to natural system, low value of drainage density that is 1.14 m/km² is due to enhancement of urban area, encroaching the drainage, thus it have increased the chances of runoff and frequent risk of frequent flooding rather it infiltration into the earth. Values of form factor and circulatory ratio indicate nearly circular shape of the basin which is controlled by the shape and relief of the basin.

INTRODUCTION

Morphometric analysis of drainage basins provides not only an elegant description of the landscape, but also serve as a powerful mean of comparing the form and process of drainage basins that maybe widely separated in space and time (Easternbrook, 1993).Morphometry of a drainage system helps in planning, management and establishment of water conservation measures in an area, it also helps to identify the gap areas in context of groundwater recharge and water table of the area. Morphometry represents the topographical expression of land by way of area, slope, shape, length, etc. Remote Sensing and GIS is an immense tool to study the terrain parameter and helps to calculate the drainage parameters using satellite image and GIS integrating tools. Satellite images can be used

for identification of drainage over a vast area, it also be verified using digital elevation model of the study area. Hydrological tools available with GIS platform is very useful for accuracy and efficient results about drainage parameters.

Study Area

Bhopal is selected for study area which includes total 147 villages notified under Town and Country Planning act 1973 which covers an area of 608.31 km². Bhopal is the second largest city in the State with a population of 2,371,061(census of India 2011). Upon reorganization of states in 1956, Bhopal emerged as the capital of Madhya Pradesh, which was the starting point of the phenomenal change in its demographic trend. Geographical extent of study area lies between

longitude $77^{\circ}15'29.756''\text{E}$ to $77^{\circ}35'18.285''\text{E}$ and Latitude $23^{\circ}24'13.904''\text{N}$ to $23^{\circ}7'46.516''\text{N}$. The regional setup of geology includes mainly Vindhyan and Deccan trap. Geomorphological

setup comprises Plateaus, Structural hills and Pediplains. Location map of study area is presented in Fig.1.

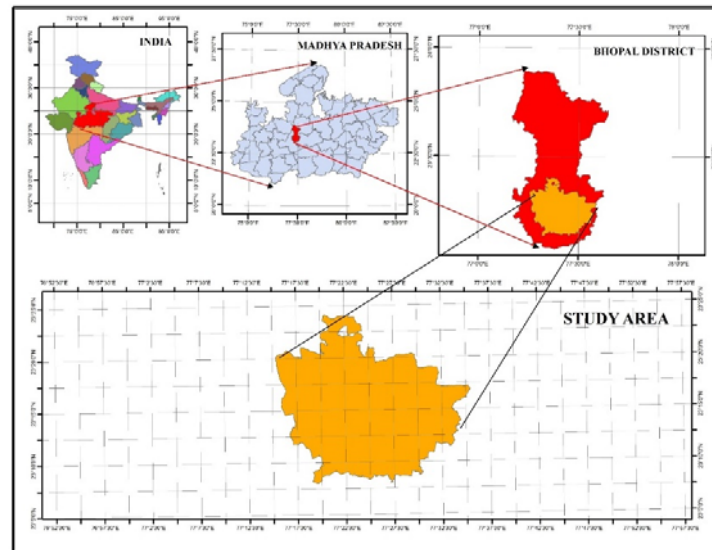


Fig.1 Location Map of the Study Area

Methodology

A short methodology was adopted to perform the study with the help of Remote Sensing satellite image of IRS LISS IV having spatial resolution of 5.8 m and GIS platform to carry out the analytical part of the estimation and calculation. Drainage network of the study area is delineated using topographic sheets and further corrected using multispectral satellite image. Linear parameters and aerial parameters measured and was used in calculation of morphometric parameters. Brief methodology is presented in Fig.2.

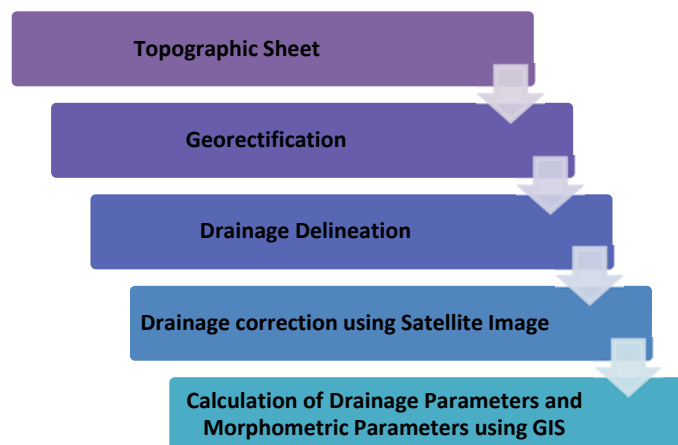


Fig.2: Brief Methodology Adopted for Morphometric Analysis

Calculation of Morphometric Parameters

The measurement and mathematical analysis of the configuration of the earth's surface shape, and dimension of its landforms is called morphometric analysis (Clarks, 1966). Basic Morphometric parameters are given in Table1.

Table 1: Basin Morphometric Parameter

Parameters	Method	Reference
Basin Area	Map Scale x counted squares	Gregory and Welling, 1973
Circulatory Ratio(Rc)	$RC = 4 \frac{\pi A}{p^2}$ where A= Basin area, P=Basin parameter and π =Constant	Miller, 1953
Bifurcation Ratio(Rb)	Rb= $Nu/Nu+1$, where Nu= Number of streams in the order U and Nu+1= Number of the streams in the higher order	Gregory and Welling, 1973
Mean Bifurcation Ratio	Rbm = Average of bifurcation ratios of all orders	Strahler (1957)
Drainage Density (DD)	DD= $\sum L/A$, where $\sum L$ = Sum of all stream length and A= Basin area	Horton, 1932
Number of Streams	Total number of streams in an order	Strahler, 1952
Elongation Ratio (El)	$El = \frac{2\sqrt{A}}{L}$ where A= Basin area and L= Basin length	Schumm, 1956
Form Factor (F)	F=A/L ² where A= Area and L= Length of the basin	Boyce and Clark, 1964
Stream Frequency (Sf)	Sf= $\sum Nu/A$ where, Nu= Number o streams and A= Area of the basin	Horton, 1945
Linear Basin Length	This is the straight line from the mouth of the basin to the farthest point on the basin perimeter.	Schumm, 1956
Total Stream Length	This is the total length of all the tributaries and the principle drainage.	Schumm, 1963

Result and Discussion

The linear aspects of a channel system deal with the quantitative analysis of landform in a basin area, where the surface runoff flowing over a long period of time tends to modify the surface geometry of the area (Horton 1945).Number of streams and drainage order present in the study area is presented in Table 2. Basin parameters calculated using GIS is presented in Table 3. Drainage map of the study area

is presented in fig.3 and stream ordering map presented in Fig.4. The bifurcation ratio and mean bifurcation ratio calculate are given Table 3.

Table 2 Number and Length of the stream in each order

S.No	Stream Order	Stream Number	Stream Length (Km)
1	I	538	386.77
2	II	258	185.40
3	III	127	92.21
4	IV	48	34.16

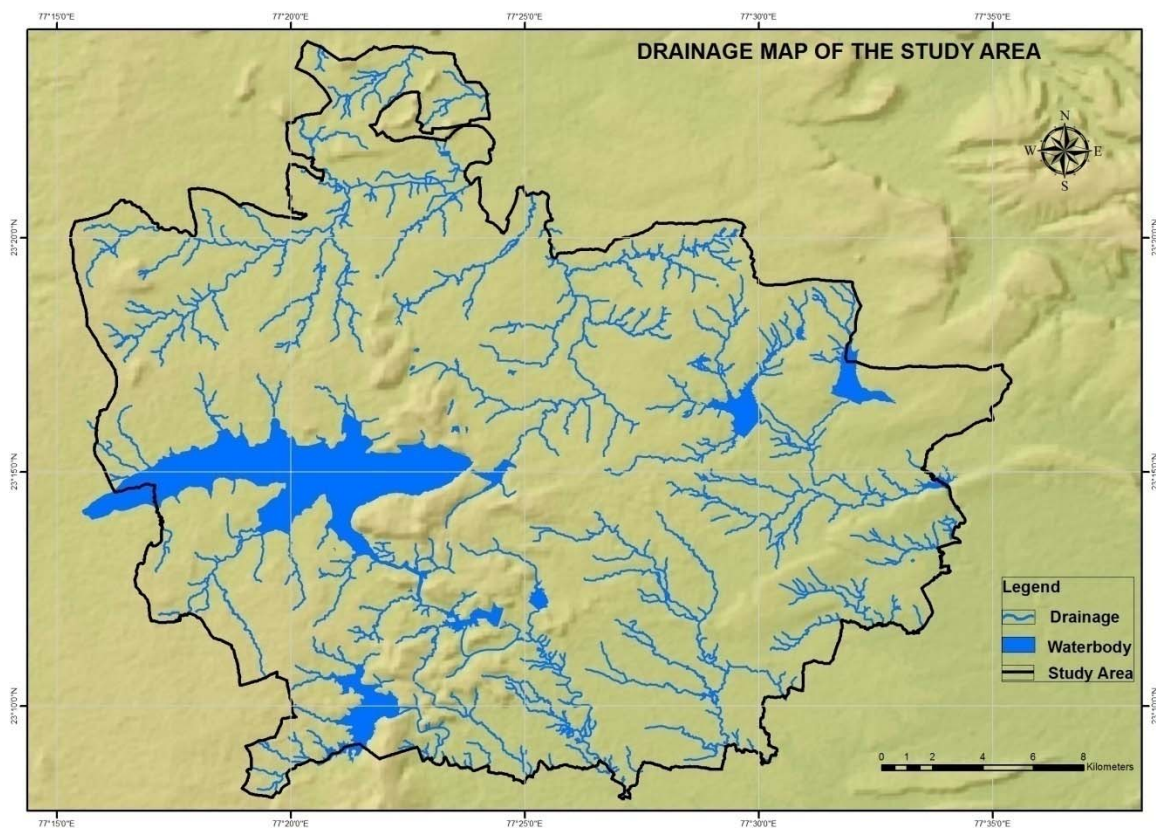


Fig. 3: Drainage Map of the Study Area

Table 3 Bifurcation Ratio and Mean Bifurcation Ratio

S.NO.	STREAM ORDER	BIFURCATION RATIO (R _b)	MEAN BIFURCATION RATIO (R _{bm})
1	I/II	2.08	2.25
2	II/III	2.03	
3	III/IV	2.64	

Aerial aspects of drainage basin include measurement of aerial elements such as basin area, basin length, shape, and drainage density, stream frequency, form factor, circulatory ratio and drainage texture in a systematic way and are illustrated in Table 4.

Table 4 Basin Parameters of the study area

S No.	Parameter	Value
1	Total Area	608.31 km ²
2	Length of the Basin	34.26 km
3	Drainage Density (D)	1.14 m/km ²
4	Stream Frequency (Fs)	1.59
5	Drainage Texture (Rt)	5.48
6	Form Factor (Rf)	0.52
7	Circulatory Ratio R (If)	0.24

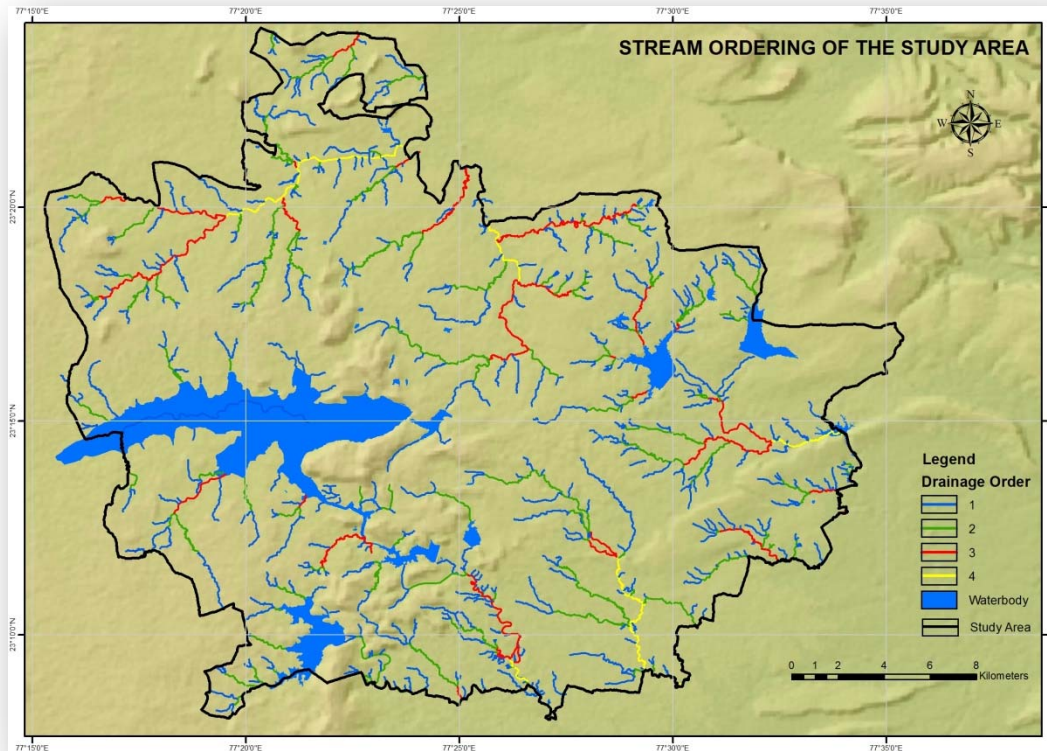


Fig. 4: Stream Ordering Map of the Study Area

Drainage pattern of the area is dendritic in nature having drainages up to 4th order which shows homogeneous rock type in the study area. The values of stream order and stream number show an inverse relation i.e. stream number decreases with increasing stream order that is quite in confirmation with Horton's Law (1945) according to that the number of streams decreases with increasing order. The mean bifurcation ratio (2.25) low values that may be attribute to more intervention of human activities in natural drainage system by various construction activities. Form factor value of the basin is 0.52 which

indicates that the present basin is circular in shape. The value of circulatory ratio of the area is 0.24 which also conforms the circular shape and the value of stream length, stream frequency and drainage texture values also signify control of geological structure, land use / land cover, climate, relief, and slope of the drainage basin.

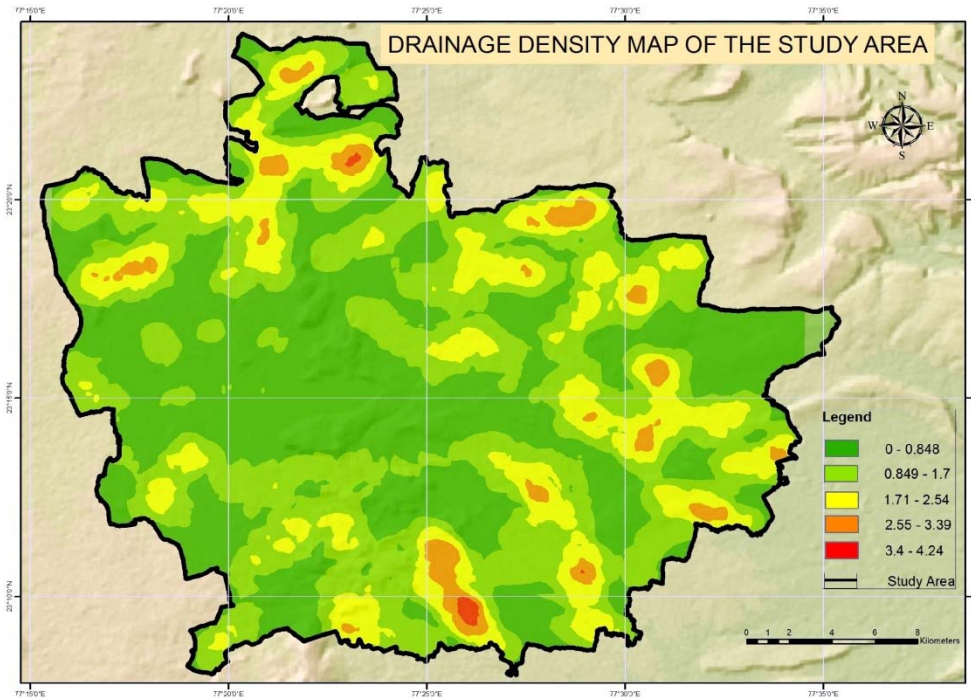


Fig. 4: Drainage Density Map of the Study Area

Conclusion

From the above study it is found that Remote Sensing and GIS tool is very useful in the field of drainage analysis and is time and cost effective also. Remotely sensed data in the form of multispectral images and digital elevation model can be used to delineate and verify drainage parameters and provide information with accuracy. Analysis of linear and aerial aspect using GIS can be utilize in watershed conservation and natural resource management practices. It also helps to establish relationship between stream characteristics, topography and hydrogeological parameters of an area.

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महामति प्राणनाथ के दर्शन पर भगवद्गीता का प्रभाव

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महामति प्राणनाथ बहुमुखी प्रतिभा के धनी, उच्चकोटि के साहित्यकार, नीतिकार, कलाकार, प्रख्यात संगीतकार, गंभीर चिन्तक, समाज सुधारक, प्रणामी धर्म के प्रणेता, धर्म समन्वयक एवं उच्चकोटि के दार्शनिक थे। सामाजिक एवं धार्मिक सद्भाव के वे ध्वजवाहक थे। दार्शनिक क्षेत्र में वे परमधाम के पथ-प्रदर्शक थे। उन्होंने प्राचीन एवं अर्वाचीन, भारतीय एवं पाश्चात्य, नैतिक, धार्मिक, आध्यात्मिक तथा पारलौकिक मान्यताओं में समन्वय एवं सामंजस्य स्थापित किया। वेद एवं कतेब, हामी एवं सामी, हिन्दू तथा अन्य धर्मों के बीच एकात्म समन्वय का अभिनव प्रयोग किया। धर्म समन्वय के वे एकमात्र ऐसे पुरोधे थे, जिन्होंने हिन्दुओं के वेद, उपनिषद्, गीता आदि ग्रन्थों, इस्लामों के कुरान, मूसा पैगम्बर का जम्बूर दाऊद पैगम्बर का तौरैत और ईसा पैगम्बर का बाइबिल आदि के दार्शनिक, धार्मिक एवं नैतिक मान्यताओं की सर्वोत्तम व्याख्या कर उनमें एक ही ईश्वर के दर्शन किये और यह स्थापित करने की कोशिश की कि विश्व के सभी धर्मों का लक्ष्य एक ही है। उनकी दार्शनिक, धार्मिक एवं नैतिक मान्यतायें आज भी भटकी हुई मानवता का पथ प्रदर्शन करने में पूर्णतः सक्षम है तथा प्रासंगिक है।

महामति प्राणनाथ ने हामी और सामी दोनों प्रचलित परम्पराओं की समन्वित मान्यताओं को कुलजमस्वरूप या तारतमवाणी में अवतरित किया है। कुलजमस्वरूप में कुल चौदह ग्रंथ हैं। श्रीरास प्रकाश, षड्रुती, कलस, सन्ध, खुलासा, खिलवत, परिक्रमा, सागर सिनगार, सिन्धी, मारफत सागर और क्यामतनामा है। गुजराती से हिन्दी में रूपान्तरण होने से प्रकाश और कलस हिन्दुस्तानी दो ग्रन्थ और जोड़े गये। इसी प्रकार क्यामतनामा छोटा और क्यामतनामा बड़ा आने के बाद ग्रंथों की कुल संख्या सत्रह हो गयी, जिनमें 524 प्रकरण तथा 1875.8 चौपाईयाँ हैं।

महामति प्राणनाथ के दर्शन का आधार वेदान्त गीता और भागवत है। वे 'खुलासा' नामक ग्रन्थ में बड़ी विनम्रता के साथ स्वीकार करते हैं कि –

वेदान्त गीता भागवत, दैयां इशारता सब खोल।
मगज मायने जाहेर किये, मोहे गुझ हते जो बोल।।
अंजीर जंबूर तौरैत चौथी जो फुरकत।
एक मायने गुझ थे जो जाहेर किये बाखान।।1

अर्थात् वेदान्त गीता और भागवत के सभी गूढ़ रहस्यों के अर्थ एवं मन्तव्यों को तारतम वाणी से स्पष्ट किया गया है। निःसंदेह महामति प्राणनाथ की वाणी में गीता के दर्शन का व्यापक प्रभाव देखने को मिलता है। विस्तारभय से मैं उन प्रसंगों का उल्लेख करना चाहूँगा जिनका तारतम वाणी में श्रीमद्भगवद् गीता का विस्तृत प्रभाव पड़ा है।

1. आत्मा की अवधारणा –

श्रीमद्भगवद् गीता के द्वितीय अध्याय में आत्मा के स्वरूप एवं आत्मा की अमरता की विवेचना की गई है। भगवान श्रीकृष्ण अर्जुन को उपदेश देते हुए कहते हैं –

'य एनं वेन्ति हन्तारं यश्चैनं मन्येते हतम्।
उभौ तौ न विजानीतो नायं हन्ति न हन्यते।।'²
न जायते म्रियते वा कदाचिन्नायं भूत्वा भविता वा न भूयः।
अजो नित्यः शाश्वतोऽयं पुराणो न हन्यते हन्यमाने शरीरे।।'³
नैनं छिन्दन्ति शस्त्राणि नैनं दहति पावकः
न चैनं क्लेदयन्त्यापो न शोषयति मारुतः।।'⁴
अच्छेद्योऽयम दाहयोऽयम क्लेद्योऽशौष्य एव च।
नित्यः सर्वगतः स्थाकुर चलोऽयं सनातन।।'⁵

अर्थात् जो इस आत्मा को मारने वाला समझता है तथा इसको मरा मानता है वे दोनों ही नहीं जानते क्योंकि यह आत्मा न मारता है न मारा जाता है। यह आत्मा न किसी काल में जन्मता है न मरता है अथवा न यह आत्मा हो करके फिर होने वाला है क्योंकि यह अजन्मा, नित्य, शाश्वत और पुरातन है। शरीर के नाश होने पर भी यह नाश नहीं होता है। इस आत्मा को शस्त्रादि नहीं काट सकते, इसको आग नहीं जला सकती, जल गीला नहीं कर सकता और वायु सुखा नहीं सकती है। यह आत्मा अच्छेद्य है, अदाहय है, अक्लेद्य और अशोष्य है। यह आत्मा निःसंदेह नित्य, सर्वव्यापक अचल, स्थिर रहने वाला और सनातन है। यह आत्मा अव्यक्त, अचिन्त्य, विकाररहित, अजर, अमर और अविनाशी है।

महामति प्राणनाथ अपने दर्शन में आत्मा को एक अजर, अमर और अविनाशी मानते हैं जो गीता पर आधारित है। वे आत्मा और परमात्मा के बीच अद्वैत भाव स्थापित करते हैं। श्रीरास में वे

कहते हैं 'आपकी आत्मा एक'⁶ आत्म सहुनी एकज दीसे जुजवी ते दीसे देह'⁷ तथा 'आमे आत्म सखियों एक'⁸ महामति प्राणनाथ तीन स्तरों से उतरी आत्माओं का वर्णन करते हैं (1) ब्रह्मसृष्टि या ब्रह्मात्म्यायें परमधाम से अवतरित होती है। ईश्वरीयसृष्टि अक्षर धाम से तथा जीवसृष्टि बैकुण्ठ से अवतरित होती है। सच्चिदानन्द ब्रह्म की बारह हजार कलायें ब्रह्मसृष्टिया ब्रह्मात्म्यायें कहलाती है। वे पर ब्रह्म परमात्मा के परमधाम की आनन्द लीला में मगन रहती हैं। महामति कहते हैं—

ब्रह्मसृष्टि आई अरस से, जीत इन्द्री सुध अंग।
छोड़ माहे वाहेर दृष्टि पर आत्म धनी संग।⁹
हम ब्रह्मसृष्टि आई धाम से, अक्षर खेल देखन।
देख देखके जागिए, घर असलू अपने तन।¹⁰

महामति कहते हैं — "ब्रह्मसृष्टि वेद कतेव में, कहीं सो ब्रह्म समान"¹¹ अर्थात् वेद और कतेव में ब्रह्मसृष्टि को ब्रह्म के समान माना गया है।

ईश्वरीयसृष्टि अक्षर ब्रह्म की सुरता स्वरूप कुमारिका सखियों को ही कहा जाता है। वे अक्षरधाम से अवतरित होती है ये तुरीय अवस्था में रहती है। वे अक्षरब्रह्म के प्रकाश से प्रकाशित है। ईश्वरीय सृष्टि में अनेक देवी देवता, परमहंस—ज्ञानीजन, साधु—सन्त, पीर—पैगम्बर और तपस्वीजन आते हैं। इन्हें मुक्तजीव या फरिश्ते कहा जाता है। महामति कहते हैं —

"और सृष्टि जो ईश्वरी, कही जाग्रत सृष्टि आत्म।
सुबुध अंग करनी सुध, चले फरमान हुकुम।
एही सृष्टि आयी अरस से, आई अक्षर नूर ले जे।
मेहेर ले महबूब की, रहे तुरीय अवस्था में।"¹²

जीवसृष्टि— जीवसृष्टि बैकुण्ठ से अवतरित होती है। जीवसृष्टि की आत्मा सूरत, भक्ति, तीनगुण और तीन पक्ष लेकर इक्यासी नश्वर पक्षों में उतरती—चढ़ती रहती है। जीवसृष्टि माया के बन्धन में बंधी रहती है। ये क्षर ब्रह्मण्ड को ही अपना विश्रान्ति स्थल मानती है। महामति प्राणनाथ कहते हैं —

"आत्म इक्यासी पख हो, सब दुनियां में खेलत।
मोह अहं मूल इनको, बस याही बीच फिरत।
मोह अहं गुन की इन्द्रियां करे फैल पसु परवान।
फिरे अवस्था तीन में ए जीव सृष्टि पेहेचान।।
सुबुध निकट न आवहीं चले बेहेर दृष्ट।
आत्म दृष्ट न लेवही, तो कहीं सुपन की सृष्ट।।
जाग्रत तरफ दुनीय की, सोवत सुपना ले।
देखत सुपना नींद से ए तीनों अवस्था जी के।।"¹³

इस प्रकार महामति प्राणनाथ ने ब्रह्मसृष्टि, ईश्वरीयसृष्टि और जीवसृष्टि तीन प्रकार की आत्म्यायें मानी है, जो क्रमशः परमधाम, अक्षरधाम और बैकुण्ठ से अवतरित होती है और पुनः निज धामों में वापस जाती है।

2. परमात्मा की अवधारणा— महामति प्राणनाथ ने अपने दर्शन के क्षर, अक्षर और पर परब्रह्म की अवधारणा स्वीकार की है। वस्तुतः क्षर, अक्षर और परब्रह्म की अवधारणा पर भगवद्गीता का प्रभाव देखा जा सकता है। भगवद्गीता में परब्रह्म अक्षरब्रह्म और पुरुषोत्तम तीन रूपों में परमात्मा का वर्णन किया गया है। गीता के आठवें अध्याय में अक्षरं परब्रह्मं परमं¹⁴ अर्थात् परम अक्षर अर्थात् जिसका कभी नाश न हो ऐसा सच्चिदानन्दधन परमात्मा तो ब्रह्म है तथा "ओमित्येकाक्षरं ब्रह्म"¹⁵ अर्थात् अक्षर रूप ब्रह्म का उल्लेख मिलता है। गीता के दशवें अध्याय में परमब्रह्म के स्वरूप का वर्णन करते हुए लिखा है —

"परंब्रह्म परम धामं पवित्रं परमं भवान।
पुरुषं शाश्वतं दिव्यादिदेवमजं विभुम।।"¹⁶

अर्थात् आप परमब्रह्म परमधाम और परम पवित्र है। आप आदिदेव, अजन्मा और सर्वव्यापी है। परमात्मा के पुरुषोत्तम रूप का वर्णन गीता के दशवें, ग्यारहवें तथा पन्द्रहवें अध्याय में किया गया है। गीता में कहा गया है कि —

"स्वमेवात्मनात्मानं वेत्थ त्वं पुरुषोत्तम।
भूत भावन भूतेश देवदेव जगत्यते।।"¹⁷

अर्थात् भूतों के उत्पन्न करने वाले हे भूतों के ईश्वर! हे देवों के देव! हे जगत के स्वामी! हे पुरुषोत्तम आप स्वयं ही अपने आप को जानते हो। परमात्मा के पुरुषोत्तम रूप में ज्ञान ऐश्वर्य, शक्ति, बल, वीर्य और तेज ये षडैश्वर्य सदा सर्वदा विद्यमान रहते हैं। अर्जुन ने श्री कृष्ण से कहा "द्रष्टुमिच्छामि ने रूपमैश्वरं पुरुषोत्तम"¹⁸ वस्तुतः पुरुषोत्तम रूप विश्वरूप परमात्मा है वह जगन्निवास सत् असत् चराचर जगत में व्याप्त है गीता में कहा गया है —

"यस्मात्क्षरमतीतोऽहम क्षरादपि चोत्तमः।
अतोऽस्मिलोके वेदे च प्रथितः पुरुषोत्तमः।।"¹⁹

अर्थात् मैं नाशवान जड़वर्ग क्षेत्र से तो सर्वथा अतीत हूँ और माया में स्थित अविनाशी जीवात्मा से भी उत्तम हूँ इसलिए लोक और वेद में भी पुरुषोत्तम नाम से प्रसिद्ध हूँ। श्री कृष्ण आगे कहते हैं —

"यो मामेवमसंमूढो जानति पुरुषोत्तम।
स सर्वविदम्भजति मां सर्व भावेन भारत।।"²⁰

हे भारत! इस प्रकार तत्व से जो ज्ञानी पुरुष मेरे को पुरुषोत्तम जानता है वह सर्वज्ञ पुरुष सब प्रकार से निरन्तर मुझे भजता है। इस प्रकार भगवद्गीता में परमात्मा को परब्रह्म, अक्षरब्रह्म और पुरुषोत्तम तीन रूपों में स्वीकार किया गया है।

महामति प्राणनाथ ने कुलजमस्वरूप में परमात्मा को अक्षरातीत या परब्रह्म, अक्षरब्रह्म एवं क्षर ब्रह्म तीन रूपों गीता दर्शन की तरह माना है।

अक्षरातीत या परब्रह्म – महामति मानते हैं कि अक्षरातीत या परब्रह्म अद्वैत, अनन्त एवं अखण्ड सत्ता है। परब्रह्म परमात्मा निजधाम उनका तेज, प्रकाश उसने नूर का विकास तथा सत चित्त आनन्द अखण्ड गुणों से पूर्ण अद्वैत पूर्ण ब्रह्म का लीलाधाम है। वे राज राजेश्वर श्री राजजी हैं। अक्षरातीत या परब्रह्म है। ऐश्वर्य आनन्द और संकल्प सिद्धि में अनन्त सामर्थ्य रखते हैं। स्वसंकल्प से एक से अनेक हो जाते हैं। ब्रह्मानन्द की रसानुभूति का अनुभव स्वलीलाद्वैत द्वारा कराते हैं। प्रणाली परम्परा में अक्षरातीत या परब्रह्म युगलकिशोर श्रीकृष्ण को माना गया है। धामधनी अक्षरातीत परब्रह्म परमधाम में विराजमाना हैं। कविवर विशाल के शब्दों में –

“अक्षरधाम के पार है पूर्ण ब्रह्म का धाम।

सर्वोपरि तेहि जानियो, पारब्रह्म परधाम।।

धामधनी श्री अक्षरातीता। श्रीकृष्ण अरु शब्दातीता।।

श्यामा श्याम श्री जुगलकिशोर। सर्वेश्वर श्री राजकिशोर।।

राज स्वलीलाद्वैत बिहारी। परमधाम विहरत सुखकारी।।”²¹

इस प्रकार अक्षरातीत पूर्णब्रह्म शब्दातीत एवं सर्वातीत है

अक्षरब्रह्म – अक्षरब्रह्म को चार विभूतियों से युक्त माना जाता है – मन का विस्तार सतस्वरूप में, बुद्धि केवल ब्रह्म में, चित केवल एवं सबलिक ब्रह्म एवं अहंकार अव्याकृत ब्रह्म स्वरूप में विस्तृत हो जाता है। सम्पूर्ण सृष्टि रचना अक्षरब्रह्म की कल्पना से रचित एवं विलीन हो जाती है। अक्षरब्रह्म परमब्रह्म अक्षरातीत की प्रकाश की एक किरण के समान है कविवर विशाल के शब्दों में

“तारतम्य बिन ब्रह्म के सकहि न लक्षण जान।

जो जनि अस ब्रह्म को, पहुँचे तेहि स्थान।।

कूटस्थ अक्षर ब्रह्म का, निर्मल चेतन रूप।

मन रूपक इस ब्रह्म को, लखो अतीत रूवरूप।।

महिमा अक्षर ब्रह्म की, अगम अगाध बखान।

फिर भी पूरन ब्रह्म के, एक किरण सम जान।।”²²

क्षरब्रह्म – माया से युक्त संसार के अधिपति को क्षर पुरुष कहा जाता है। महामति प्राणनाथ क्षरपुरुष को आदिनारायण या महाविष्णु मानते हैं। वह अक्षर पुरुष की सत्ता में रहकर ब्रह्माण्ड का नियमन करते हैं और प्रलय की अवस्था में अक्षर ब्रह्म के चतुष्पाद अव्याकृत में लीन हो जाते हैं। वे संसार के स्वामी हैं।

इस प्रकार महामति प्राणनाथ अपनी वाणी में क्षर, अक्षर और पर ब्रह्म तीन रूपों में स्वीकार करते हैं जो भगवद्गीता में पुरुषोत्तम अक्षरब्रह्म और पर ब्रह्म के समान हैं अतः कहा जा सकता है कि महामति प्राणनाथ द्वारा प्रवर्तित परमात्मा की अवधारणा गीतादर्शन से प्रभावित है।

3. स्वधर्म की अवधारणा – भगवद्गीता में भगवान श्रीकृष्ण ने स्वधर्म के पालन का उपदेश दिया है। गीता में कहा गया है–

“श्रेयान्स्वधर्मो विगुणः परधर्मोत्स्विनुष्ठितात्।

स्वधर्मे निधनं श्रेयः पर धर्मो भयावहः।।”²³

अर्थात् रागद्वैव को जीतकर स्वधर्म का आचरण करो क्योंकि अच्छी प्रकार आचरण किये हुए दूसरे धर्म से गुणरहित भी अपना धर्म अति उत्तम है। अपने धर्म में मरना भी कल्याणकारक है और दूसरे का धर्म भय देने वाला है।

महामति प्राणनाथ ने भी स्वधर्म की श्रेष्ठता का प्रतिपादन किया है। उन्होंने हिन्दू धर्म की रक्षा के लिए आजीवन प्रयास किये। अनेक राजाओं को हिन्दू धर्म की रक्षा के लिए प्रेरित किया। उन्होंने औरंगजेब की हिन्दू विरोधी नीति का विरोध किया। अपनी धर्म यात्रा के अन्त में महाराजा छत्रसाल मिले जिन्होंने हिन्दू धर्म की रक्षा के लिए मुगलों से अनेक युद्ध लड़े। महामति प्राणनाथ ने उन्हें हीरो और वीरों का आशीर्वाद दिया। छत्रसाल ने उन्हें अपना गुरु माना। प्रणामी सम्प्रदाय में महामति प्राणनाथ और छत्रसाल का वही स्थान है जो राम भक्तों के बीच श्रीराम और हनुमान का है। जहाँ-जहाँ प्राणनाथ की जयकार होती है वहाँ-वहाँ छत्रसाल की जयकार होती है। यह स्थान और सम्मान स्वधर्म की रक्षा और परधर्म की अस्वीकृति के कारण मिला है। महामति प्राणनाथ ने स्वधर्म की श्रेष्ठता और परधर्म की भयावहता को गीता से ग्रहण किया था।

4. अनन्यभक्तिभाव से अनन्यप्रेमलक्षणाभक्ति – भगवद्गीता में अनन्य भक्ति का उपदेश दिया गया है। गीता में श्री कृष्ण कहते हैं –

“वीतरागभयक्रोधा मन्मया मामुपाश्रिता।

वहवो ज्ञानतपसा पूता मदभावभागता।।”²⁴

अर्थात् राग भय और क्रोध से रहित अनन्य भाव से मेरे में स्थित वाले मेरे शरण हुए बहुत से पुरुष ज्ञान रूप तप से पवित्र हुए मेरे स्वरूप को प्राप्त हो चुके हैं।

गीता के भक्ति योग में श्रवण, कीर्तन, स्मरण, पादसेवन, वन्दन, अर्चन, दास्य, सख्य और आत्मनिवेदन को नवधाभक्ति के रूप में स्वीकार किया गया है। आर्त्त, जिज्ञासु, अथार्थी और ज्ञानी चार प्रकार के भक्त होते हैं। भक्त को दृढनिश्चयी, उद्वेगरहित, कर्मफल त्यागी और निष्काम भाव वाला होना चाहिए। अनन्यभक्ति में भक्तों के समस्त भाव परमात्मा में केन्द्रित हो जाते हैं। मनबुद्धि सब परमात्मा में लय हो जाने पर अनन्य भक्ति का उदय होता है।

महामति प्राणनाथ ने अपनी वाणी में गीता के अनन्यभक्तिभाव को लेकर अनन्यप्रेमलक्षणाभक्ति का उपदेश दिया है। महामति के दर्शन में अनन्य प्रेमलक्षणा भक्ति को मोक्ष प्राप्ति का परम साधन माना गया है। पुरुष भाव से नहीं बल्कि नारी भाव का सम्पूर्ण समर्पण इस अनन्यप्रेमलक्षणाभक्ति है। महामति मानते हैं कि सखी भाव से पातिव्रत धर्म का पालन करते हुए प्रेमलक्षणा भक्ति द्वारा परमधाम के अखण्ड सुखों को प्राप्त किया जा सकता है। भक्तिमार्ग उपासक जिस सालोक्य, सारूप्य, सानुज्य और सायुज्य मुक्ति की बात करते हैं वह चारों प्रकार की मुक्ति अनन्यप्रेमलक्षणाभक्ति की चार दासी बन जाती है वह नवधा भक्ति से भी परे हैं नवरंगवाणी में कहा गया है –

प्रेमलक्षणा भक्ति को पेहेचानो रे कोई।

गाई ते महाविष्णु ने अखंडानंद सोई।

नवधा ते न्यारी कहीं, प्रेम लक्षणा जेही ।
नाही पिंड ब्रह्मांड में, किन किए एही ।।
नवधाभक्ति बैकुण्ठ लो मुक्त चार उदासी ।
प्रेम लक्षणाभक्ति की, मुक्त चार है दासी ।।

इस प्रकार महामति प्राणनाथ अनन्यप्रेमलक्षणाभक्ति को मोक्ष प्राप्ति का सर्वोच्च साधन निरूपित किया है ।

5. परमधाम की अवधारणा – परमधाम का वर्णन करते हुए मुण्डकोपनिषद में कहा गया है –

“न तत्र सूर्यो भाँति ने चन्द्रतारकं, नेमा विद्युतोभान्ति कुतोऽयमग्निः ।
तमेव भान्तमनुभाति सर्व, तस्य मासा सर्वमिदं विभाति ।।”²⁵

महामति प्राणनाथ के दर्शन में परमधाम का विस्तृत वर्णन किया गया है । परमधाम के अवधारणा का भगवद्गीता में व्याख्या की गई है । गीता में कहा गया है –

अव्यक्तोऽक्षर इत्युक्तस्तमाहः परमांगतिम् ।
यं प्राप्य न निवर्तन्ते तद्धाम परमं मम् ।।²⁶

वह जो अव्यक्त अक्षर, ऐसे कहा गया है । उसे ही अक्षर नामक अव्यक्त भाव को परमगति कहते हैं तथा जिस सनातन अव्यक्त भाव को प्राप्त होकर मनुष्य पीछे नहीं आता है । वह मेरा परमधाम है । “न तदभासयते सूर्यो न शशांको न पावकः ।

तदत्वा न निवर्तन्ते तद्धाम परमं मम् ।।”²⁷

अर्थात् उस स्वयं प्रकाशमय परमपद को न सूर्य प्रकाशित कर सकता है । न चन्द्रमा और न अग्नि ही को प्रकाशित कर सकता है तथा जिस परमधाम को प्राप्त होकर मनुष्य पीछे संसार में नहीं आते वही मेरा परमधाम है । गीता में कहा गया है कि जिसने मान और मोह को जीत लिया है । आसक्ति रूप दोष जिनने और परमात्मा के स्वरूप में है जिनकी कामना नष्ट हो गई है । वे सुखदुःख नामक द्वन्द्वों से मुक्त हुए ज्ञानीजन उस अविनाशी परमपद को प्राप्त होते हैं । गीता के शब्दों में –

“निमनिमोह जितसंगदोषा अध्यात्म नित्या विनिवृत्तकामा ।

द्वन्द्वैर्विमुक्ता सुखदुःख संज्ञैर्गच्छन्त्यमूढा पदमव्ययं तत् ।।”²⁸

श्रीकृष्ण गीता में कहते हैं कि –

“नित्रिधं नरकस्येदं द्वारं नाशनमात्मनः ।

कामः क्रोधस्तथा लोभस्तस्मादेतस्त्रयं त्यजेत ।।

एवैर्विमुक्तः कोन्तेय तमो द्वारैस्त्रिभिर्नरः ।

आचरव्यात्मनः श्रेयस्ततो याति परामतिम् ।।”²⁹

अर्थात् हे अर्जुन काम क्रोध तथा लोभ ये तीनों नरक के द्वार हैं ये आत्मा का नाश करने वाले हैं ये तीनों त्याग देना चाहिए । इन तीनों नरक के द्वारों से मुक्त हुआ अर्थात् विकारों से छूटा हुआ पुरुष अपने कल्याण का आचरण करता है वह परमगति अर्थात् मेरे को प्राप्त होता है ।

गीता में परमधाम का उल्लेख अवश्य किया गया है लेकिन परमधाम का वर्णन नहीं मिलता है । महामति प्राणनाथ ने अपने दर्शन में परमधाम का विशद वर्णन किया है । उन्होंने कहा है कि अक्षरातीत परमब्रह्म परमात्मा श्री राज, श्यामा एवं ब्रह्मात्माओं का निवास स्थल एवं स्वलीलाद्वैत परमब्रह्म परमात्मा की दिव्य शोभा से परिपूर्ण स्वयं सिद्ध प्रकाशरूप परमधाम सदा सर्वदा एकरस, नित्य, चेतन, अखण्ड सामग्री से युक्त अनंत है । यह परमात्मा सत् चित्त आनन्द अनन्त और अद्वैत इन पाँच भावों से परिपूर्ण है । महामति प्राणनाथ ने अपने कुलजमस्वरूप में परमधाम को अक्षरातीत धाम, शब्दातीतधाम, अखण्ड परमधाम, बेहद, चिन्मय ब्रह्माण्ड, अर्शेअजीम, मूलवतन, निजधाम तथा लीलाधाम आदि नामों से संबोधित किया है ।

महामति प्राणनाथ के अनुसार परमधाम अखण्ड अनादि और अनन्त है । खिलवत में महामति कहते हैं–

‘जित आदि अन्त न पाइए, तित तेहकीक होय क्यों कर’³⁰
सिनगार में कहा गया है –

‘अरस सबे है चेतन, हर चीज में सब गुन’³¹

‘या पहाड़ या तिनका सो सब चीज आतम’³²

‘मौत उठा पेटे नहीं कायम अरस भुमान’³³

महामति परिक्रमा में कहते हैं कि परमधाम । सदा सर्वदा आनन्दमय है ।

‘कहियत नेहेचल नाम, सदा सुखदाई धाम
साथ स्यामाजी श्याम बिलासत आठों जामरी’³⁴

इस संसार के वैकुण्ठ, बैकुण्ठ के परे अक्षरधाम और अक्षरधाम के परे परमधाम है ।

महामति कहते हैं कि परमधाम में सब कुछ दिव्य प्रकाश से प्रकाशित है । उन्होंने परमधाम के पच्चीस पक्षों का वर्णन किया है । ये रंगमहल, हौज कौसर ताल, कुंज, निकुंज, जवरो की नहरें, मानिक पहाड़, पश्चिम की चौगान, बड़ा वन, पुखराज, पर्वत, सात घाटों से युक्त यमुना, आठ सागर, नूरसागर, नीरसागर, क्षीरसागर, दधिसागर, धृतसागर, मधुसागर, सुधारससागर तथा सर्वरस सागर, दो-दो महासागरों के बीच विशाल भूमि या जिसके आठखण्ड है । इस परमधाम में दस भौम हैं । मूल मिलावा, भुलवनी, भोजन भूमि, नृत्यभूमि, शयनभूमि, सुखपाल भूमि, दो-दो हिंडोला की पंक्तियाँ, चार-चार हिंडोला की पंक्तियाँ, दूरलक्ष्या छप्जे एवं दसवीं चन्द्रभूमि आकाशी । परमधाम की आकाशी भूमि में ही रातों दिव्य लीला होती है । साधना में इन्हीं पच्चीस तत्वों का साधक ध्यान करके परमधाम के अखण्ड सुखों की अनुभूति करता है । परमधाम की प्रत्येक वस्तु परमब्रह्म अक्षरातीत के ही प्रकाश से प्रकाशित है । सभी परब्रह्म के नूर स्वरूप है । महामति के अनुसार परमधाम अविनाशी एकरस, आनन्दमय एवं तेजोमय है । तारतम्य ज्ञान से परमधाम का द्वार खुल सकता है । मानवजीवन का अंतिम लक्ष्य नश्वर जगत को छोड़कर परमधाम के अखण्ड सुखों को प्राप्त करना है ।

महामति प्राणनाथ के कुलजमस्वरूप में आत्म धर्म पर स्वधर्म का अनन्यप्रेमलक्षणाभक्ति पर अनन्य भक्ति भाव का व्यापक प्रभाव देखने को मिलता है । ज्ञानयोग भक्तियोग, कर्मयोग, निष्काम

कर्मयोग, स्थिरबुद्धि, समत्वयोग आदि का प्रभाव महामति के चिन्तन में दिखाई पड़ता है। गीता के उपदेशों का व्यापक प्रभाव किरन्तन, श्रीरास, प्रकाश गुजराती, कलश हिन्दुस्तानी, सागर खुलासा, खिलवत, सन्ध, षडरुती, परिक्रमा आदि ग्रंथों में स्पष्टतः देखा जा सकता है। आत्मजाग्रति, जागनीदर्शन, सेवा, मेहेर या कृपा, मंत्रजाप एवं श्रीकृष्ण नाम महिमा चितवनी या ध्यान तथा अनन्यप्रेमलक्षणाभक्ति का प्रमुख आधार गीता दर्शन ही है। परमधाम के वर्णन में महामति प्राणनाथ मौलिकता खुलकर सामने आई है। अष्ट प्रहर की सेवा में संध्या के समय गौरी आरती के पूर्व सद्गुरु वन्दना में यह पद गाया जाता है –

“वेद थके ब्रह्मा थके, थक गये शेष महेश।
गीता को जहाँ गम नहीं, वह सतगुरु का देश।।”

संभवतः मुकुन्ददास की नवरंगवाणी का यह पद उसी परमधाम की ओर संकेत करता है जहाँ परमब्रह्म परमात्मा का निवास और अखण्ड सुखों का केन्द्र है। निष्कर्षतः हम कह सकते हैं कि महामति प्राणनाथ के चिन्तन में भगवद्गीता का व्यापक प्रभाव देखा जा सकता है।

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भारत में बेरोजगारी की समस्या व समाधान

शिवाली शाक्या

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सार संक्षेप

भारत में बेरोजगारी की समस्या एक गंभीर समस्या है। शिक्षा की कमी, रोजगार के अवसरों की कमी, बढ़ती जनसंख्या, कौशल की कमी, साहसिकता का अभाव आदि ऐसे कई कारक हैं जो इस समस्या को बढ़ाने में अपना योगदान देते हैं। व्यक्तिगत प्रभावों के साथ-साथ पूरे समाज एवं देश पर इस समस्या के नकारात्मक प्रभाव पड़ते हैं जिससे देश व समाज में असुरक्षा की स्थिति उत्पन्न हो जाती है और देश को इसके प्रतिकूल प्रभावों का बोझ उठाना पड़ता है। सरकार ने इस समस्या को नियंत्रित करने के लिए रोजगार सृजन हेतु कई प्रकार के कार्यक्रमों का शुभारंभ किया है जैसे :- मेक इन इंडिया, स्टार्ट अप, प्रधानमंत्री कौशल विकास योजना, स्वरोजगार के लिए प्रशिक्षण, प्रधानमंत्री की समन्वित शहरी गरीबी उन्मूलन कार्यक्रम, रोजगार गारण्टी योजना, इन्टीग्रेटेड रूरल डेवलपमेंट प्रोग्राम (IRDP), लघु एवं कुटीर उद्योगों को प्रोत्साहन, मुद्रा लोन योजना, बेंटी-बचाओं, बेंटी-पढ़ाओं, आवास योजना, सुकन्या समृद्धि आदि। परंतु अभी तक इन योजनाओं के परिणाम पूर्ण रूप से संतोषजनक नहीं मिले हैं जिससे देश को भारी विपत्तियों का सामना करना पड़ रहा है एवं देश का आर्थिक विकास भी नहीं हो रहा है जिससे हमारा देश आज भी विकासशील राष्ट्रों की श्रेणी में है। सरकार ने बेरोजगारी को दूर करने हेतु कई सुविधाएँ तो प्रदान की हैं परन्तु कुछ व्यक्तियों द्वारा इन सुविधाओं का गलत उपयोग भी किया जा रहा है और इतनी सुविधाओं के बावजूद भी वे बेरोजगार बने हुए हैं। अतः सरकार द्वारा इस समस्या को नियंत्रित करने हेतु कार्यक्रमों को शुरू करना ही काफी नहीं है बल्कि उनकी प्रभावशीलता पर भी ध्यान देना जरूरी है और सरकार को आवश्यकता पड़ने पर उन्हें संशोधित करने का भी कदम उठाना चाहिए।

परिचय :-

बेरोजगारी किसी भी देश की प्रमुख बाधाओं में से एक है। भारत में बेरोजगारी एक गंभीर समस्या है। शिक्षा का अभाव, आर्थिक साधनों का अभाव, कौशल व प्रशिक्षण का अभाव, अच्छे रोजगार अवसरों की कमी आदि ऐसे कई कारण हैं जो बेरोजगारी को बढ़ावा दे रहे हैं। इस समस्या का समाधान करने के लिए एवं भारत देश को विकसित बनाने के लिए बेरोजगारी को समाप्त करना अत्यंत आवश्यक है। यह केवल देश के विकास में ही बाधा उत्पन्न नहीं करती बल्कि व्यक्ति और पूरे समाज पर भी कई तरह के नकारात्मक प्रभाव डालती है। बेरोजगारी की स्थिति व्यक्ति को गलत काम करने हेतु प्रेरित करती है जब मनुष्य अधिक प्रयत्नों के बाद भी अच्छी नौकरी या व्यवसाय हासिल नहीं कर पाता है तो वह बुरी आदतों की ओर अग्रसर हो जाता है एवं गलत कार्यों में लिप्त हो जाता है जिसका दुष्प्रभाव देश व समाज को भुगतना पड़ता है।

बेरोजगारी का अर्थ होता है किसी व्यक्ति को उसकी योग्यता व ज्ञान के अनुसार सही काम या नौकरी का नहीं मिल पाना। भारत में बेरोजगारी लोगों के जीवन में दो प्रकार से आक्रमण कर रही है इसमें मुख्य रूप से दो वर्ग प्रमुख हैं पहले वर्ग में वह शिक्षित लोग आते हैं जिनके पास अच्छी शिक्षा व डिग्रियाँ होने के बावजूद भी अच्छी नौकरियाँ नहीं हैं वे नौकरी व रोजगार की तलाश में भटकते रहते हैं परंतु वे इतना पैसा नहीं कमा पाते कि वे उससे अपना व अपने परिवार का अच्छी प्रकार से भरण-पोषण कर सकें एवं अपने बच्चों को अच्छी व ऊँची शिक्षा दिला सकें। इन्हीं कारणों से

बेरोजगारी अभिशाप बनती जा रही है क्योंकि बेरोजगारी से प्रभावित व्यक्ति फिर गलत तरीकों से पैसा कमाने की कोशिश करता है एवं गलत राह पर चलकर वह अपना जीवन बर्बाद करता है जिसके फलस्वरूप कभी-कभी वह अपने समाज व देश को भी नुकसान पहुँचाने का कार्य करता है।

I. उद्देश्य :-

भारत में बेरोजगारी की स्थिति का अध्ययन करना एवं बेरोजगारी से देश में उत्पन्न चुनौतियों का मुल्यांकन कर सुझाव प्रस्तुत करना।

II. भारत में बेरोजगारी के कारण :-

1. भारत में बेरोजगारी का सबसे प्रमुख कारण जनसंख्या वृद्धि है। जनसंख्या के आधार पर भारत विश्व का द्वितीय अधिक जनसंख्या वाला देश है अर्थात् देश की जनसंख्या इतनी अधिक है कि सभी लोगों को रोजगार मिल पाना संभव नहीं है। हमारे देश के संसाधनों की तुलना में जनसंख्या वृद्धि की गति कहीं अधिक है जिसके फलस्वरूप देश का संतुलन बिगड़ता जा रहा है। यही भारत देश के लिए चुनौती भी है कि उसकी आर्थिक गति में वृद्धि नहीं हो पा रही है।
2. रोजगार के अवसरों में कमी होना भी बेरोजगारी का बहुत बड़ा कारण है। देश में रोजगार के अवसर अधिक नहीं मिल पाते हैं और यदि मिलते भी हैं तो यहाँ के लोग उसका लाभ नहीं उठा पाते हैं। वे स्वयं भी किसी भी प्रकार की जोखिम नहीं लेना चाहते क्योंकि उनमें साहस व कौशल की कमी है उन्हें किस प्रकार से कैसा व्यवसाय करना है वे उसे समझ नहीं पाते हैं।

3. हमारी शिक्षा व्यवस्था का भी बेरोजगारी में काफी योगदान है। वर्तमान समय में हमारी शिक्षा पद्धति में परिवर्तन तो हुआ है परंतु इतना अधिक नहीं। शिक्षा पद्धति में कम्प्यूटर अनिवार्य तो किया गया है परन्तु स्कूलों व कॉलेजों में कम्प्यूटर शिक्षा के लिए पर्याप्त टीचर नहीं है साथ ही स्कूलों व कॉलेजों में पढ़ाने वाले अध्यापकों की ड्यूटी बाहर या अन्य बाहरी परीक्षाओं में लगाए जाने के कारण उनकी कक्षाएँ निरंतर रूप से नहीं लग पाती हैं जिससे शिक्षा प्रभावित होती है। इसके साथ ही वर्तमान शिक्षा का आधार प्रायोगिक नहीं है। व्यक्ति स्कूली शिक्षा में जो भी सीखता है वह प्रायोगिक रूप में नहीं कर पाता है। यही कारण है कि उच्च शिक्षा प्राप्त करने के पश्चात् भी उसे अच्छी नौकरी नहीं मिल पाती है।
4. बेरोजगारी का एक बड़ा कारण लघु उद्योगों का नष्ट होना एवं उनकी महत्ता कम होना है। इसके फलस्वरूप देश के लाखों लोग अपने पैतृक व्यवसाय से विमुख होकर रोजगार की तलाश में भटक रहे हैं। शासन के द्वारा उनके लिए गृह व्यवसाय खोलने हेतु बहुत से कार्यक्रम चलाए जा रहे हैं किंतु फिर भी उनके पास पैसों की कमी होने के कारण वे अपना स्वयं का व्यवसाय खोलने में असफल रहे हैं।
5. भ्रष्टाचार भी बेरोजगारी का बहुत बड़ा कारण है। भ्रष्टाचार के कारण कई पढ़े-लिखे एवं योग्य व्यक्तियों को उनकी योग्यता के अनुसार कार्य नहीं मिल पा रहा है जबकि इसके विपरीत कम पढ़े-लिखे व अयोग्य व्यक्ति अच्छे ऊँचे पद पर अफसर बने बैठे हैं। ये सब भ्रष्टाचार के कारण ही हो रहा है। आज वर्तमान में ऑन-लाईन सिस्टम होने के बावजूद भी कई प्रकार की धाँधलियाँ हो रही हैं।

III. भारत में बेरोजगारी को दूर करने हेतु समाधान :-

1. बेरोजगारी को नियंत्रित करने हेतु सबसे पहला समाधान भारत की बढ़ती हुई जनसंख्या को नियंत्रित करना है जिससे कि जनसंख्या व देश के संसाधनों के बीच संतुलन स्थापित हो सके।
2. भारत के शिक्षा के स्तर में बदलाव व बढ़ोत्तरी की जाना चाहिए अर्थात् उन्हें स्कूल व विश्वविद्यालय का सिलेबस ऐसा बनाना चाहिए जो कि व्यक्तियों के कौशल का विकास कर सके। शिक्षा पद्धति में कुशल श्रम को विकसित करने का उद्देश्य होना चाहिए साथ ही जो विद्यार्थियों को उद्यमशीलता के बारे में प्रायोगिक ज्ञान प्रदान कर सके।
3. उद्यमी बनने व उद्योग लगाने हेतु सहायता व प्रशिक्षण प्रदान करना परंतु उनकी प्रक्रिया भी शीघ्रतापूर्वक पूरी होने वाली होना चाहिए जिससे कि वे जल्दी से जल्दी व्यवसाय शुरू कर सकें।
4. चूंकि वर्तमान समय में अधिकांश व्यक्ति गाँवों से शहर की ओर पलायन कर रहे हैं अतः उन्हें गाँव में ही विकास करने हेतु प्रोत्साहित करना चाहिए उनके लिए अच्छी योजनाएँ व सुविधाएँ प्रदान करना चाहिए जिससे कि ग्रामीण क्षेत्रों का भी विकास हो सके एवं वहाँ के लोगों को रोजगार प्राप्त हो सके।

5. सरकार द्वारा मेक इन इंडिया, स्टार्ट अप, इज टू इंडिंग बिजनेस, प्रधानमंत्री कौशल विकास योजना आदि तो प्रारंभ की गई हैं परंतु इन योजनाओं को लोगों द्वारा उपयोग करने के तरीकों को भी सिखाया जाना चाहिए। इसकी जानकारी प्रत्येक बेरोजगार युवक तक पहुँचाने का प्रयत्न करना चाहिए जिससे कि प्रत्येक बेरोजगार इन योजनाओं का लाभ उठा सके एवं स्वयं का व्यवसाय स्थापित कर देश के आर्थिक विकास में अपना योगदान दे सके।
6. मादक पदार्थों का सेवन भी बेरोजगारी के प्रमुख कारणों में से एक है। जब व्यक्ति को रोजगार नहीं मिलता है तो वह अपनी स्वयं की आवश्यकताओं को पूरा नहीं कर पाता है और वह अपने दुःखों को भुलाने हेतु नशे का सेवन करने लगता है। इस कारण उसके कार्य करने व सोचने-समझने की क्षमता दिन-प्रतिदिन कम होती जाती है। वह अपने साथ अन्य व्यक्तियों को भी शामिल करने लगता है अतः मादक पदार्थों के सेवन पर सरकार को नियंत्रण लगाना चाहिए एवं इन्हें बंद करने का प्रयत्न करना चाहिए। सामान्यता मादक पदार्थों के सेवन के पश्चात् ही देश में लड़ाई-झगड़ा एवं अन्य गलत कृत्य होने की संभावना रहती है।

IV. निष्कर्ष :-

बेरोजगारी भारत देश के सामने एक विकट समस्या है। जब तक बेरोजगारी समाप्त नहीं होगी तब तक देश का आर्थिक विकास होना संभव नहीं है अतः देश की सरकार को सबसे पहले बेरोजगारी को समाप्त करने का प्रयत्न करना चाहिए। भारत देश की सरकार ने इसे समाप्त करने का कदम तो उठाया परंतु यह प्रयत्न फिर भी अधिक सफल नहीं हो सका है। वर्तमान में सरकार इस बात पर अधिक बल दे रही है कि देश के सभी युवक स्वावलंबी बनें वे केवल सरकारी सेवाओं पर ही आश्रित न रहें अपितु उपयुक्त तकनीकी व व्यावसायिक शिक्षा ग्रहण कर स्वरोजगार हेतु प्रयास करें। सरकार नवयुवकों को उद्यम लगाने हेतु कम ब्याज दरों पर ऋण भी प्रदान कर रही है एवं उचित कौशल प्रशिक्षण देने में भी सहयोग कर रही है। हो सकता है कि बदलते परिपेक्ष्य में हमारे देश के नवयुवक कसौटी पर खरे उतरेंगे और देश में फैली बेरोजगारी जैसी समस्या को दूर करने में सफल होंगे।

V. संदर्भ ग्रंथ सूची :-

1. उद्यमिता कौशल विकास – डॉ.एस.सी.जैन
2. उद्यमिता विकास – डॉ.एच.एन.मिश्रा
3. व्यावहारिक अर्थशास्त्र – डॉ.एस.सी.जैन
4. दैनिक भास्कर एवं नई दुनिया-दैनिक समाचार पत्र
5. भारत सरकार की नवीन योजनाएँ-PM Jan Aavas Yojana, Startup, make in India, PM Mudra Yojna , etc.
6. Important Magazines - India Today, Times of India & Yojana

Article

Greene's Art of Plot Construction

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Graham Greene is a catholic novelist treating of sin as a means to redemptive salvation . The unheroic protagonist through the estrangement and fall commit acts of violence and sin and thereby enter a moral universe . his journey is that of "The Sinner to Sainthood", and the values he affirms and live by have an unmistakable stamp of the true spirit of Christianity.

The novel is organized and unified whole. In the novel there is relationship between character, setting, and action. Without some elementary sense of structure and organization one can not write a novel. James says "Form is substance, to that degree that there is absolutely no substance without it." The term 'plot ' is definite a literary term .Plot is a chain of events in a story and the principle ,which knits it together. In novels certain incidents happen and in a certain order.It is the order ,which distinguishes one kind of plot from another .In the novels like "Treasure Island" and "Vanity Fair" the incidents take a certain order.

The term "plot" and "story" is often used interchangeably because the novelists have not bothered to explain the difference between the two ."The blame for this lack of clarity must rest partly with eighteenth century neoclassicists whose interpretations of classical 'rules' were often confused and contradictory, and partly with Aristotle himself 'whose account of the relationship between Uoos and Jipayua ta (i.e. plot and the incidents or things done which combine to makeup a narrative)leaves a good

deal unanswered." In order to arouse suspense and excitement the novelist complicates his arbitrary mystification to form Plot .So plot is sequence ordered by a particularly mature conception of the relationship between cause and effect .Plot can become aesthetically more valuable and important when the Novelist's central conception is also there in the plot along with other narrative devices . Miss Compton - Burnett believes in the importance of plot ,she allows here characters to conceal ,and then sometimes to uncover every crime in the calender from blackmail to incest and matricide.By the time of eighteenth century there were two different kinds of fiction associated with the Novelist's mode of solving basic technical problems. Johnson, Richard, Cumberland, Mrs. Barb auld and scott are the writers who felt that the intrusive 'Omniscient' author had his attention fixed on the 'dial plate'. Fresh form of fiction appeared due to the changes that took place in the nineteenth century. According to this 'subject', 'method' and 'point' of 'attack' the novelist will produce anyone of the following structure :

(1)The novelist will be a commentator on the broad tendencies and attitudes of the society or an age .He portrays life by employing different elements like comedy,irony,and satire Fieling and Dickenson also wrote these type of novels.

(2) The novelist will analyze the feelings and emotions of an individual .He will appear as an

exclusive artist interpreting life by irony and sometimes illuminating tragic experience .Jane Austin and Henry James also wrote these types of novels.

(3) The novelist will act as a sage or prophet and will combine the pattern with his or her feeling .George Eliot is a writer of this pattern.

(4) The fourth form of fiction is that in ,which the novelist is a prophet .The novelists like Dostoevsky and D.H. Lawrence also wrote these type of novels. The most simple form of prose fiction is the story ,which records a succession of events ,generally marvelous. Plot is a narrative of events in, which more emphasis is laid on causality. Ford Madox says that ‘Story’ is really a characteristic of ‘Plot’. Story tells about the sequences of events.In the real novel there is always ‘plot’ and never simply ‘story’. Plot is a causal sequence complicated by mystery. Graham Greene has divided his fiction into two groups: Novels and “entertainments “.His aim is evidently to draw a distinction between his serious work and lighter fair of “Thrillers”.

A few critics who have remarked on the similarity between the works of two groups ,have not explored the implications. A writer may try his hands at different forms, but the man behind them all is the same person. The genuine writer can not cut himself entirely in two, turning on or shutting off his deepest interest and preoccupations at will. While the novels will take seriously the theme of spiritual and existential problems, the “entertainment” have been written in a lighter vein. But since God and search for belonging is the focus of almost whole of his earlier work and indirectly his later work and indirectly his later work .The

“entertainments”, too, touch upon this theme .There is not break between the subject matter of the two. The difference in attitude towards subject matter is also one of degree rather than of kind . The entertainments break from the novel only from the viewpoint of angle and emphasis. In a way Greene has been concerned more or less with the lot of humanity .Graham Greene in his essay “The Marxist Heretic” has emphasized the desirability of co-operation between the Catholics and Communists for the betterment of mankind .He talks about “...The possibility ,not of a merely chilly co-existence, but of co-operation between Catholicism and Communism.”

The basic fact behind all this is that Greene is a man among men. It is not the ideology which matters; what matters is the sense of adjustment and understanding among people of diverse ideologies. No, doubt Greene’s endeavour is to transcend the evil rampant in this world. In order to acquire his purpose he depicts a fascinating picture of evil. His vision of life is coloured by gloom, dejection and ugliness, pain and violence ,and his characters are given to sin and despair. But Greene in his novels journeys back towards the promise of joy and reunion with the society .His spirit awakens to the buzz and bloom of life. To try to feel from life would lead to the void that has always seduced the experts of doom. Greene’s emphatic allegiance to life gives his voice an accent of maturity. Life is larger than any pose .One must see beyond despair and loss at the dissolution of ego to joy at embracing the world .Escape is never the Greene’s way .His way is the way of affirmation .one is reminded of the answer of Kubla Khan, in the face of death and pain in Micro millions,” Be proud of life .Know in your heart that living of life can be noble. Be exalted by life. Be inspired by death. Be humbly proud .Be proudly humble,” W.B. Yeats sang of the same exalted perception in

his

“A dialogue of Self and Soul’
When such i cast out remorse
So great a sweetness flows into the
breath
We must laugh and we must sing.
We are blest by everything
Everything we look upon is blest.
Greene’s quest for an ethics that may be
both just and possible in human

situation that is presently seen to be desperate
,assumes a meaningful urgency today.He is,,in
short ,a test of moral principle ,and every reader
or spectator must decide to what degree he
should respect and trust him,especially in
matters of the nature of truth,the value of
illusion,the limits of hope set by potentialities of
man and power of will.Greene solves the
problem of evil by making explicit what man have
always found to be the essence of tragedy –

the courageous affirmations of life in the face of
individual defeat.

Graham Greene’s first
entertainment was *Stamboul Train* (1932) which
he wrote to rescue himself and his family from
financial strain. *Stamboul Train* was a success and
money started pouring in. More entertainments
followed to make for his growing family .He made
a distinction between a novel and an
entertainment .In entertainment his primary
concern is to entertain the reader through a
plot,action and melodrama while in his novels he
was serious preoccupation with religious and ethical
problems

All through the novels Greene's
vision is that of gloom and ugliness ,pain and
violence and his characters are given to sin and
despair .But Greene's obsession with evil gripped
him in his early childhood. The secret of Greene's
personality lies in his childhood ,as he would be
the first to admit

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Effect of Resonance light cycles, Testosterone and Diazepam on reproductive system in Rat

Neetu Purohit

ABSTRACT

In the present study Diazepam, a benzodiazepine is used with Testosterone hormone to find out the photoperiodic circadian response in the rats. The present investigation is carried out with adult male rat, of Wistar Strain. Rats were exposed to certain light dark combinations like 6L:6D, 6L:18D, 6L:30D, 6L:42D, 6L:54D and 6L:66D and termed as Resonance light cycles. Rats were given hormonal treatment using Testosterone Propionate in the dose of 50 µg/1ml. alternately for 28 days. The psychoactive drug diazepam was also given to the rats in the concentration of 0.2 mg/ml in drinking water after half an hour of testosterone injection.

Testicular growth is found significantly higher in 6L:6D, 6L:30D and 6L:54D which has behaved as long day as compared to 6L:18D, 6L:42D and 6L:66D. It is maximum in the 6L:6D group. However body weight, lipid contents and haematological parameters does not differ statistically. It is observed that there is no effect of diazepam on testicular response to testosterone under different resonance cycles. This might have happened perhaps due to the reason that diazepam could not alter the photoperiodic pathway of testosterone treated rats. However the possibility of the action of such a potent psychoactive drug cannot be excluded at this instance.

INTRODUCTION

Circadian rhythms research is gaining wider acceptability and recognition for a long period of time. The term circadian system was first introduced by Halberg (1960) and it was studied in almost all forms of organisms (Kumar and Rani, 1999, Tolle et al, 2002). There are two main approaches to study biological rhythms. The first approach is to find out the effect of environmental inputs circadian clocks and the second approach is to study the biochemical mechanisms. The contributions of Erwin Bunning in the first half of this century have been very useful for our current understanding of the properties of circadian rhythms (Bunning, 1960, 1973) .

Daily rhythms in many behavioural, physiological and bio-chemical functions are generated by endogenous oscillators that function as internal 24 hrs clocks. Under constant conditions or non-periodic environment these rhythms have been shown to 'freerun' with a period close to but usually different from 24 h, generally being in the range of 22 to 26 hours hence the name 'circadian' which means literally about a day (Latin: circa-about; dies-a day; Halberg 1959). The circadian clocks have so far been extensively described only in Eukaryotes. Amphibian pineal complexes, which in anurans include the frontal organ as well as the pineal proper, contain true photoreceptor cells and synthesize melatonin rhythmically under cyclic lighting conditions (Korf et al, 1998). Birds have the capacity to obtain

information about the photic environment from retinal, pineal and deep encephalic photoreceptors (Menaker et al, 1997; Foster and Soni, 1998).

More recently, the identification of numerous putative clock genes that has allowed an important potential for reaching advances in the understanding of both, where and how the melatonin signal is transduced (Messenger et al 1999). The SCN of the anterior hypothalamus is thought to be the site of the circadian clock in Hamsters (Takahashi and Zatz, 1982).

In a series of experiments benzodiazepine, triazolam and other pharmacological agents have been demonstrated to evoke phase shifts in constant darkness and the direction of phase shift is dependent upon the circadian time of administration (Turek and Losee, Olson, 1986 ; Zatz, 1979).

In the present study Diazepam, a benzodiazepine is used with testosterone to find out the photoperiodic circadian response in the rats.

Methodology

The present investigation is carried out with adult male Rat, *Rattus, rattus*, of Winstar Strain order Rodentia. They are commonly known as albino rat.

Feeding and maintenance

Albino rats were locally purchased and bred in the laboratory. Animals in the weight range of 115-125 gm were used in the study. They were placed under 14L:10D photoperiod for acclimatization period of atleast two weeks prior to experimentation. Rats about four in numbers were housed in plastic cages of the size 40 x 26 x 15 cm. Water bottle with regulated flow was used for drinking. They were given water soaked grams and animal feed and water ad libitum.

After acclimatization in captivity, rats were moved into the photochambers for experimentation.

Photoperiodic treatment

During the course of the study, rats were exposed to different photoperiodic schedules. They were exposed to artificial photoperiodic treatments in light proof wooden chambers. The period of light and dark was controlled by automatic time switches. Rats were exposed to certain light dark combinations. These Photoperiodic schedules are 6L:6D, 6L:18D, 6L:30D, 6L:42D, 6L:54D and 6L:66D and termed as Resonance light cycles. In the resonance light treatment the total duration of light and dark period was other than 24 hours.

Hormonal and drug treatment

Rats were given hormonal treatment using Testosterone propionate. Testosterone was purchased in the name of aquaviron of 25mg/ml concentration in water soluble form. The testosterone injections were given to male rats in the dose of 50 μ g/1ml alternately for 28 days. Intra muscular injections of testosterone were given in the thigh muscles of the rats on alternate days at a fixed time 10 to 10:30 hrs clock time.

The psychoactive drug diazepam was also used in the experiments. The diazepam was purchased in the commercial name of valium-2 that is equivalent to diazepam 2 mg which is water soluble. The diazepam was given to the rats in the concentration of 0.2 mg/ml in drinking water half an hour after testosterone injection.

The initial control (IC) was used as the reference for all parameters and intra group difference was taken for statistical analysis. After last exposure to the photoperiod, hormonal and drug treatment the animals from each groups were

sacrificed. The organs like testis and accessory reproductive organs (seminal vesicles and epididymis) were taken out. The blood samples were collected for biochemical estimations.

Body weight

Body weight of the animals was observed before and after the treatment i.e. resonance light cycles, testosterone and diazepam. In all the experiments initial and final body weights were recorded.

Testis and accessories weight

Testis and accessories (seminal vesicle and epididymis) were removed carefully. The organs were cleaned and blotted on blotting paper. The weight of testis and accessories (seminal vesicle and epididymis) was taken on single pan electrical balance of sensitivity nearest to 0.1 mg. In all cases the data are presented as the total weight of paired testis, seminal vesicle and epididymis (it is expressed for testis as combined testicular weight).

Lipid contents

In all experimental schedules serum level of triglycerides and cholesterol was estimated by using specific kits.

Haematological parameters

During the course of the study the haemoglobin level (gm%), total R.B.C. and total W.B.C. was studied. To determine the haemoglobin level standard haemometric method was used. The total number of R.B.C. and W.B.C. was calculated after counting in the appropriate chambers for respective blood corpuscles in the haemocytometer.

Statistical analysis

The mean value (m) of all the parameters was taken. The standard error of mean was calculated for each mean (SE) value by taking into account the standard deviation and the value of n. The level of significance was taken by using students 't' test. The significance level is expressed in term of 'P' value wherever found within the limit of significance (Fisher,1963).

Data

Table No.1

Effect of resonance light cycles, testosterone and diazepam on testis and accessory reproductive organs

Resonance Light Cycles	Combined testicular Weight (gm) (Mean±SE)	Paired Seminal Vesicle Weight (gm) (Mean±SE)	Paired Epididymal Weight (gm) (Mean±SE)
6L : 6 D	3.36 ± 0.18	0.57 ± 0.020	0.61 ± 0.031
6L : 18 D	*2.20 ± 0.14	0.65 ± 0.019	0.60 ± 0.027

6L : 30 D	3.19 ± 0.27	0.64 ± 0.016	0.58 ± 0.023
6L : 42 D	$*2.16 \pm 0.24$	0.58 ± 0.018	0.56 ± 0.021
6L : 54 D	3.20 ± 0.21	0.56 ± 0.014	0.52 ± 0.020
6L : 66 D	$* 2.06 \pm 0.11$	0.55 ± 0.016	0.54 ± 0.022
	3.30 ± 0.17	$*0.40 \pm 0.015$	0.59 ± 0.030

* The comparison of the two values found significant ($P < 0.01$) by students 't' test.

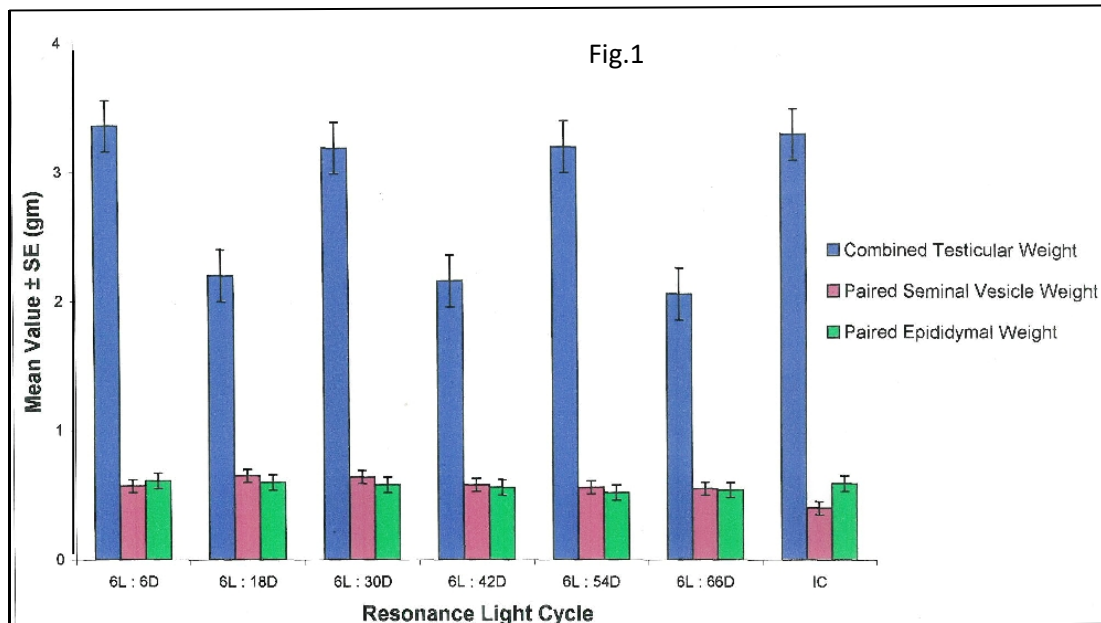


Figure showing the effect of resonance light cycles, testosterone and diazepam on testis, seminal vesicle and epididymal weight (mean \pm SE) of rat

TABLE NO. 2

Effect of resonance light cycles, testosterone and diazepam on body weight and lipid contents

Resonance Light Cycles	Body Weight (gm) (Mean \pm SE)		Triglyceride (mg/100 ml) (Mean \pm SE)	Cholesterol (mg/100ml.) (Mean \pm SE)
	Initial	Final		
6L : 6 D	125 \pm 5.64	127 \pm 5.88	92.0 \pm 5.52	95.1 \pm 7.02
6L : 18 D	120 \pm 4.93	118 \pm 4.56	91.2 \pm 5.06	95.3 \pm 7.55
6L : 30 D	118 \pm 4.81	121 \pm 4.83	91.7 \pm 4.97	94.8 \pm 6.84
6L : 42 D	125 \pm 5.57	126 \pm 4.99	89.9 \pm 4.82	94.2 \pm 6.43
6L : 54 D	125 \pm 5.74	127 \pm 4.22	86.3 \pm 4.53	93.9 \pm 6.29
6L : 66 D	116 \pm 4.93	117 \pm 4.06	87.2 \pm 5.29	95.0 \pm 7.12
IC			86.0 \pm 5.10	93.0 \pm 5.87

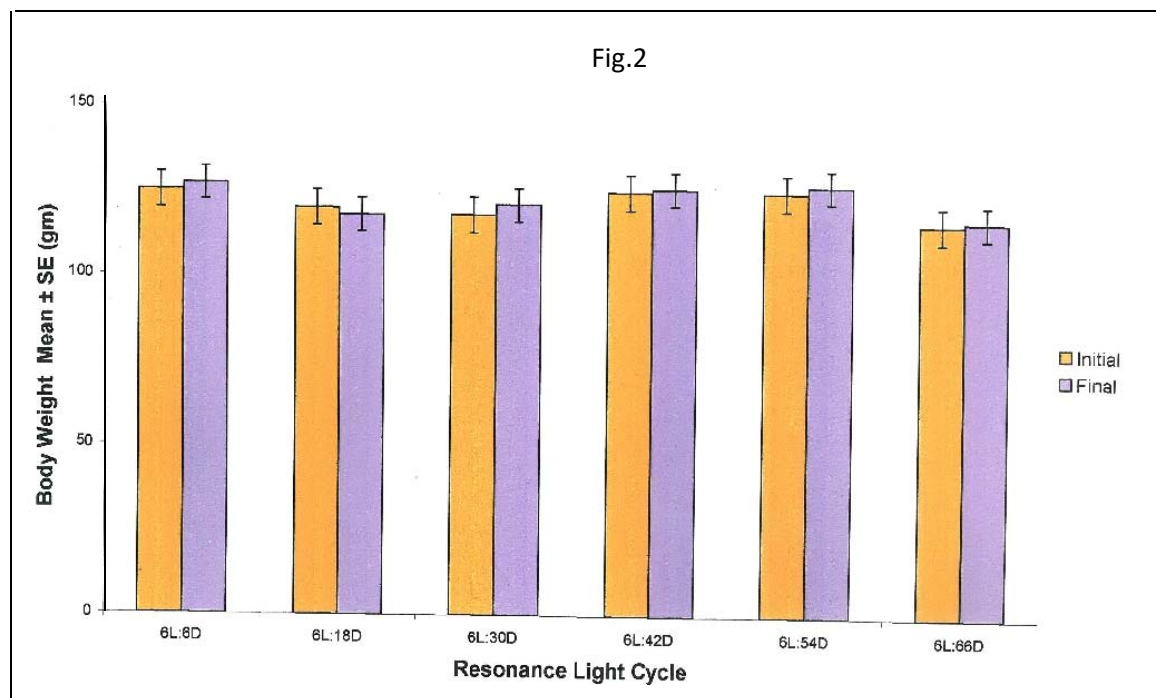


Figure showing the effect of resonance light cycles, testosterone and diazepam on body weight (mean \pm SE) of rat

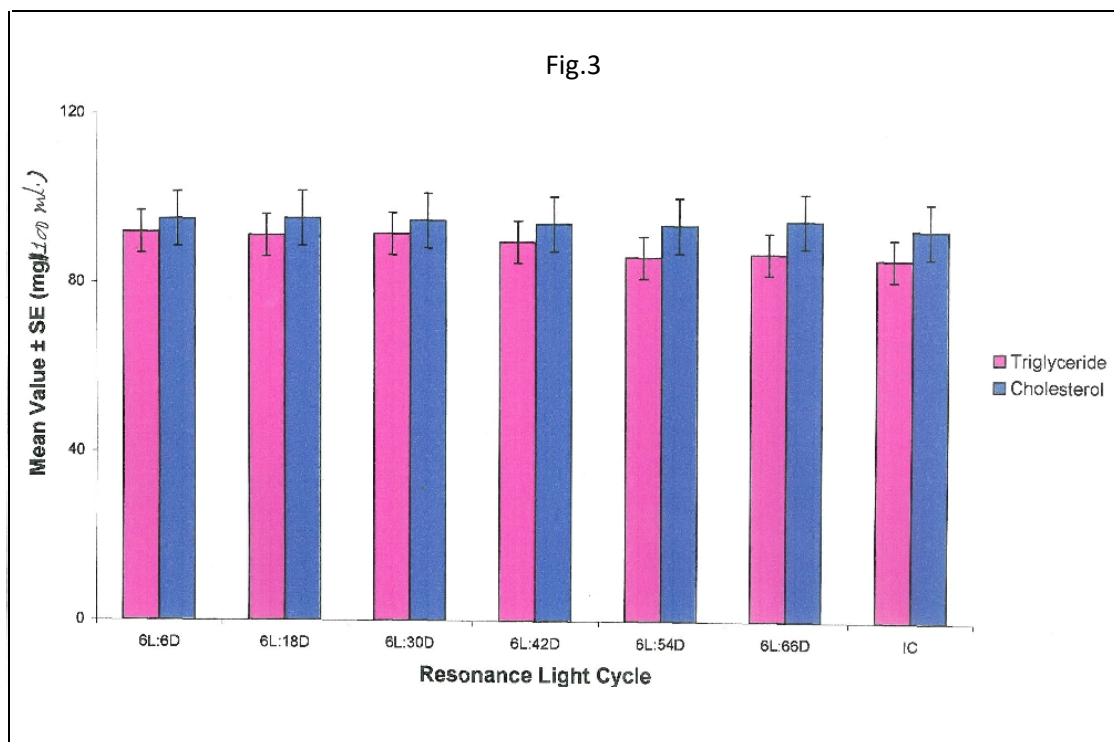


Figure indicates the effect of resonance light cycles, testosterone and diazepam on triglyceride and cholesterol (mean \pm SE) of rat

TABLE NO. 3

Effect of resonance light cycles, testosterone and diazepam on blood parameters

Resonance Light Cycles	Haemoglobin gm% (Mean \pm SE)	Total R.B.C. (Mean $\times 10^6$ /Cu.mm.)	Total W.B.C. (Mean $\times 10^3$ /Cu. mm.)
6L : 6 D	13.0 \pm 0.93	4.06 \pm 0.19	4.61 \pm 0.17
6L : 18 D	13.5 \pm 0.99	4.23 \pm 0.21	4.53 \pm 0.19
6L : 30 D	13.6 \pm 1.54	4.24 \pm 0.26	4.66 \pm 0.22
6L : 42 D	13.9 \pm 1.25	4.48 \pm 0.29	4.90 \pm 0.25
6L : 54 D	13.7 \pm 0.84	4.51 \pm 0.32	4.87 \pm 0.31
6L : 66 D	14.1 \pm 1.30	4.82 \pm 0.30	5.05 \pm 0.33
IC	14.0 \pm 1.13	4.46 \pm 0.23	4.84 \pm 0.24

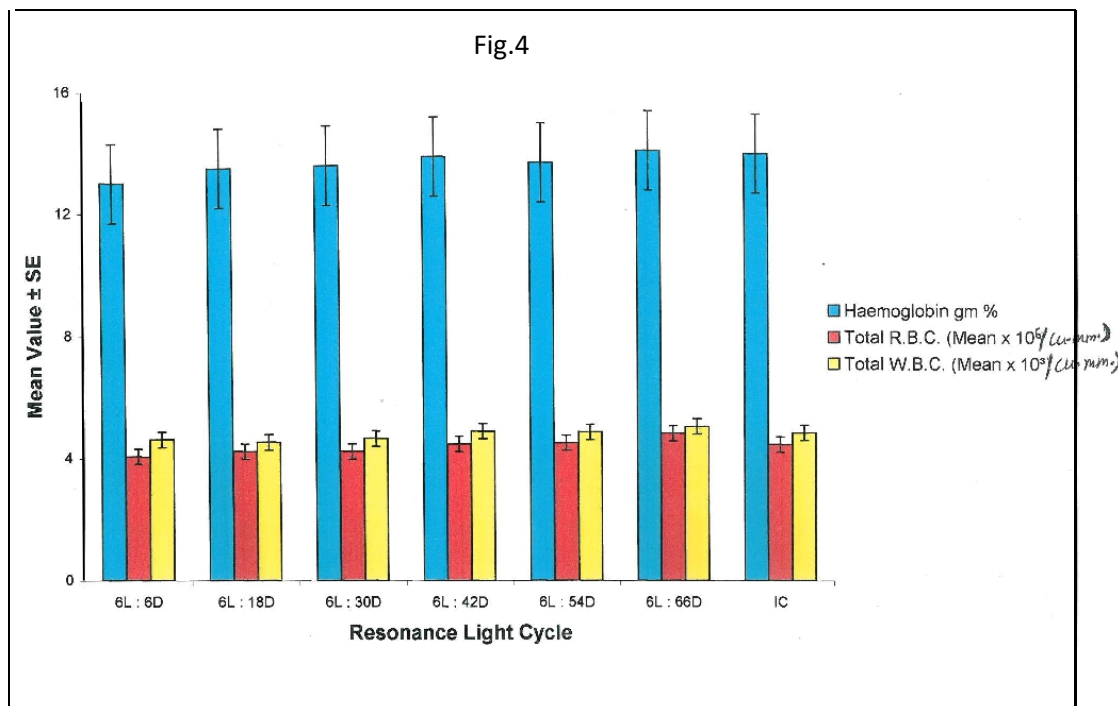


Figure indicates the effect of resonance light cycles, testosterone and diazepam on haemoglobin, total R.B.C. and total W.B.C. count (mean \pm SE) of rat

Results

Effect on testis and accessory reproductive organs :

Testicular weight of the initial control group is compared with final testicular weight in all the photoperiodic schedules. There is significant difference among the groups of the different photoperiods and initial control group. The testicular response in 6L:18D, 6L:42D and 6L:66D groups was found significantly different ($P < 0.01$) as compared with the response in the 6L:6D, 6L:30D, 6L:54D and initial control. Fully grown seminal vesicle is observed in all groups and in the initial control group. The Epididymal weight of all the treated groups as well as initial control rats remain statistically at the same level (table1, fig.1).

Effect on body weight

Initial and final body weight of the rats does not change significantly after four weeks of drug treatment (table2,fig.2).

Effect on Lipid parameters

Lipid parameters such as triglycerides and cholesterol also show the similar trend and it is observed that the serum level of both triglycerides and cholesterol of different photoperiodically and drug treated groups as well as initial control group do not show any statistical difference (table2,fig.3).

Effect on haematological parameters

The analysis of the haematological parameters of different treated rats as well as initial control group show that the percent haemoglobin in all the groups remains statistically the same. Total R.B.C. count observed is also remain same among the drug treated groups and in the initial control group. Total W.B.C. number increased in all the photoperiodically and drug treated groups as compared with that of the initial control group (table3,fig.4)

It is observed that in the hormone treated group testicular growth is found significantly higher in 6L:6D, 6L:30D and 6L:54D which has behaved as longday as compared to 6L:18D, 6L:42D and 6 L:66D. The testicular growth is maximum in the 6L:6D group, but this increased weight is similar to the initial control group (fig.1).

The testosterone treatment was present in the experiment but along with diazepam. It is observed that there is no effect of diazepam on testicular response to testosterone under different resonance cycles. This might have happened perhaps due to the reason that diazepam could not alter the photoperiodic pathway of testosterone treated rats. Similar pattern of testicular response under resonance light cycles has been reported in many avian and mammalian species (Bunning, 1960; Malik et al, 2002; Turek, 1987).

The haematological parameters such as gram percent haemoglobin and R.B.C Count of various photoperiodically, hormonal and drug treated rats also remain the same, whereas the total W.B.C. Count increased in all the photoperiodically and drug treated animals as compared to the initial control (fig.4)

Discussion and conclusion

The investigation carried out in the present work has amply demonstrated the role of circadian system in the photoperiodic time measurement of a non photoperiodic mammal. The photoperiodicity is induced or expressed in the rats when treated with testosterone. Furthermore, the results with circadian tools provides strong support to the view that the ability to monitor the photoperiodic time in such non photoperiodic mammal depends upon the endogenous circadian photosensitivity rhythm.

The results of the various experiments performed under both normal 24hrs and non 24hrs photoperiodic schedules treated with testosterone and diazepam clearly indicate that the rats do not respond to the photoperiodic treatments and thus reproduce in non-photoperiodic environment. Testosterone sensitizes the animal to discriminate between a long and short photoperiod and thereby conditional reproductive photoperiodicity is induced in the rats. The results also reveal that the photoperiodic time measurement involves circadian photosensitivity rhythm. Such a rhythm of photosensitivity is probably entrained by the light alone because the administration of diazepam in the present study could neither alter nor induce the photoperiodic response of the rats under testosterone treatments. However the possibility of the action of such a potent psychoactive drug cannot be excluded at this instance.

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Effect of Photoperiod and Testosterone on reproductive system in Rat.

Neetu Purohit

ABSTRACT

The present investigation is carried out with adult male rat of Wistar Strain. Rats were exposed to different photoperiods such as 3L:21D, 6L:18D, 8L:16D, 12L:12D and 16L:8D. They were also given hormonal treatment using Testosterone propionate in the dose of 50 µg/1ml. alternately for 28 days. It is observed that the testicular weight increased in 12L:12D and in 16L:8D (longday) as compared to short photoperiodic groups ($P < 0.01$) but this increased testicular weight in 16L:8D is similar as initial control group. In other accessory reproductive organs very little statistical difference is seen among various treated groups. Other parameters like body weight, lipid contents and haematological parameters does not differ statistically.

Our results clearly indicates that the rats respond to different photoperiods distinctly. Long photoperiod (above 12 hrs duration of light) induce differential photoperiodic effect. This has happened when the rats were treated with testosterone hormone. This type of conditional photoperiodicity has also been reported in other mammals. Testosterone sensitizes the animal to discriminate between a long and short photoperiod and thereby conditional reproductive photoperiodicity is induced in the rats.

INTRODUCTION

Majority of the vertebrates reproduce under the regulation of environmental factors. These environmental factors act as cue to trigger their reproductive events. The species which use photoperiodic information for reproductive events are called photoperiodic species. The term photoperiod and photoperiodism were first introduced by Garner and Allard (1923). According to the duration of daylight there are mainly two photoperiodic groups : 1) Short Day (SD) – These groups accelerate in day, which is shorter than a critical day length, 2) Long Day (LD) – Which is accelerated when the daily light periods exceed a 'critical day length'.

Seasonal changes in day length are used as a proximate cue by many photoperiodic species to trigger changes in reproductive activity in anticipation of changing environmental conditions (Aschoff, 1981; Baker, 1938; Chandola et al, 1973; Kumar and Follett, 1993; Kumar, V. 2002). Light is probably the most important zeitgeber (time-setter) in the environment. Its detection requires a photoreceptive mechanism. In vertebrates , photoreceptive organs, such as the eyes and pineal glands of some species, may not only perceive light but may also transduce that information into neural or chemical signals (Farner,1980; Farner et al,1977). In1960, J.Aschoff demonstrated the persistence of rhythmicity in mice that were reared for several

successive generations in an aperiodic environment. Circadian rhythms were not a learned phenomenon (Pittendrigh and Dann, 1976 ; Pittendrigh, 1974). Such original investigations were carried out with several species of birds and mammals. Enough information is available that support the involvement of circadian component in photoperiodic response pathway (Kumar, 2002; Menaker et al, 1997; Turek, 1989). In a number of rodents exposure to short day length (usually less than 12 hrs. of light per 24 hrs) causes nearly complete regression of the gonads and cessation of spermatogenesis (Turek et al 1984; Plant, 1981).

In the present study testosterone hormone with different photoperiods is used in rats to find out the photoperiodic circadian response in the rats.

Methodology

The present investigation is carried out with adult male Rat, *Rattus rattus*, of Wistar Strain order Rodentia. They are commonly known as albino rat

Feeding and maintenance

Albino rats were locally purchased and bred in the laboratory. Animals in the weight range of 115-125 gm were used in the study. They were placed under 14L:10D photoperiod for acclimatization period of at least two weeks prior to experimentation. Rats about four in numbers were housed in plastic cages of the size 40 x 26 x 15 cm. Water bottle with regulated flow was used for drinking. They were given water soaked grams and animal feed and water ad libitum. After acclimatization in captivity, rats were moved into the photochambers for experimentation.

Photoperiodic treatment

During the course of the study, rats were exposed to different photoperiodic schedules. They were exposed to artificial photoperiodic treatments in light proof wooden chambers. The period of light and dark was controlled by automatic time switches. The light and dark periods consisting of a total 21 hrs are divided as 3 hrs of light and 24 hrs of dark (3L:21D), 6 hrs light and 18 hrs dark (6L: 18 D), 8 hrs of light and 16 hrs of dark (8 L: 16 D), 12 hrs of light and 12 hrs of dark (12L: 12 D) and 16 hrs of light and 8 hrs of dark (16L: 8D). In the above photoperiodic schedule the light and dark cycles like 3L:21D, 6L:18D, 8L:16D and 12 L:12D are term as short and 16L:8D, long photoperiod. This has been referred for many avian and mammalian species as the photoperiodic threshold for induction of gonadal growth and body weight response (Farner 1975, Tewari and Tripathi 1983).

Hormonal treatment

Rats were given hormonal treatment using Testosterone propionate. Testosterone was purchased in the name of aquaviron of 25mg/ml concentration in water soluble form. The testosterone injections were given to male rats in the dose of 50 μ g/1ml alternately for 28 days. Intra muscular injections of testosterone were given in the thigh muscles of the rats on alternate days at a fixed time 10 to 10:30 hrs clock time. The initial control (IC) was used as the reference for all parameters and intra group difference was taken for statistical analysis. After last exposure to the photoperiod and hormonal treatment the animals from each groups were sacrificed. The organs like testis and accessory reproductive organs (seminal vesicles and epididymis) were taken out. The blood samples were collected for biochemical estimations.

Body weight

Body weight of the animals was observed before and after the treatment i.e., photoperiodic and testosterone. In all the experiments initial and final body weights were recorded.

Testis and accessories weight

Testis and accessories (seminal vesicle and epididymis) were removed carefully. The organs were cleaned and blotted on blotting paper. The weight of testis and accessories (seminal vesicle and epididymis) was taken on

single pan electrical balance of sensitivity nearest to 0.1 mg. In all cases the data are presented as the total weight of paired testis, seminal vesicle and epididymis (it is expressed for testis as combined testicular weight).

Lipid contents

In all experimental schedules serum level of triglycerides and cholesterol was estimated by using specific kits.

Heamatological parameters

During the course of the study the haemoglobin level (gm%) , total R.B.C. and total W.B.C. was studied . To determine the haemoglobin level standard haemometric method was used. The total number of R.B.C. and W.B.C. was calculated after counting in the appropriate chambers for respective blood corpuscles in the haemocytometer.

Statistical analysis

The mean value (m) of all the parameters was taken. The standard error of mean was calculated for each mean (SE) value by taking into account the standard deviation and the value of n. The level of significance was taken by using students 't' test. The significance level is expressed in term of 'P' value wherever found within the limit of significance (Fisher, 1963).

Data

Table No.1

Effect of photoperiod and testosterone on testis and accessory reproductive organs

Photoperiod	Combined testicular Weight (gm) (Mean±SE)	Paired Seminal Vesicle Weight (gm) (Mean±SE)	Paired Epididymal Weight (gm) (Mean±SE)
3L : 21D	* 2.18 ± 0.20	0.53 ± 0.020	0.62 ± 0.031
6L:18D	* 2.05 ± 0.20	0.51 ± 0.019	0.61 ± 0.030
8L:16D	* 2.13 ± 0.25	0.52 ± 0.017	0.63 ± 0.032
12L:12D	3.08 ± 0.10	0.54 ± 0.020	0.65 ± 0.028
16L:8D	3.36 ± 0.14	0.56 ± 0.021	0.67 ± 0.034
IC	3.20 ± 0.16	* 0.39 ± 0.018	0.56 ± 0.026

* The comparison of the two values found significant (P<0.01) by students 't' test.

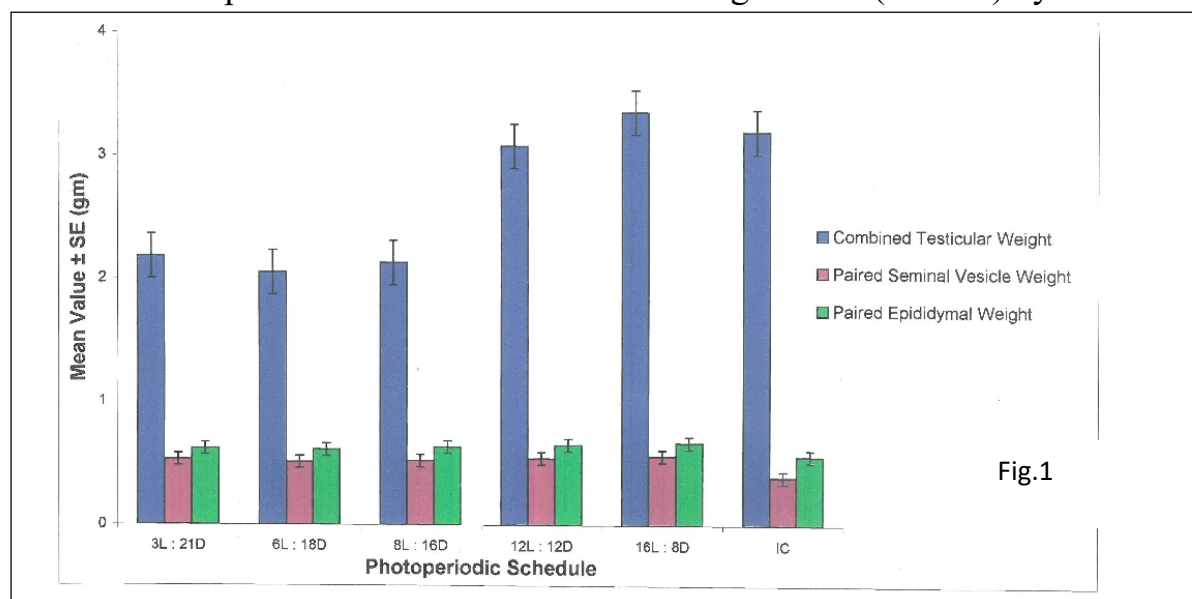


Fig.1

TABLE NO. 2

Effect of photoperiod and testosterone on body weight and lipid contents

Photoperiod	Body Weight (gm) (Mean ± SE)		Triglyceride (mg/100 ml) (Mean ± SE)	Cholesterol (mg/100ml.) (Mean ± SE)
	Initial	Final		
3L:21D	115 ± 4.82	117 ± 4.11	84.2 ± 4.16	93.0 ± 6.10
6L:18D	125 ± 5.16	124 ± 4.87	86.9 ± 3.92	92.6 ± 6.81
8L:16D	116 ± 4.99	118 ± 4.96	84.3 ± 3.83	91.7 ± 6.65
12L:12D	120 ± 5.63	122 ± 5.24	87.5 ± 4.69	92.8 ± 6.69
16L:8D	125 ± 5.88	121 ± 5.81	86.7 ± 5.08	92.0 ± 6.12
IC			85.1 ± 4.62	92.4 ± 7.04

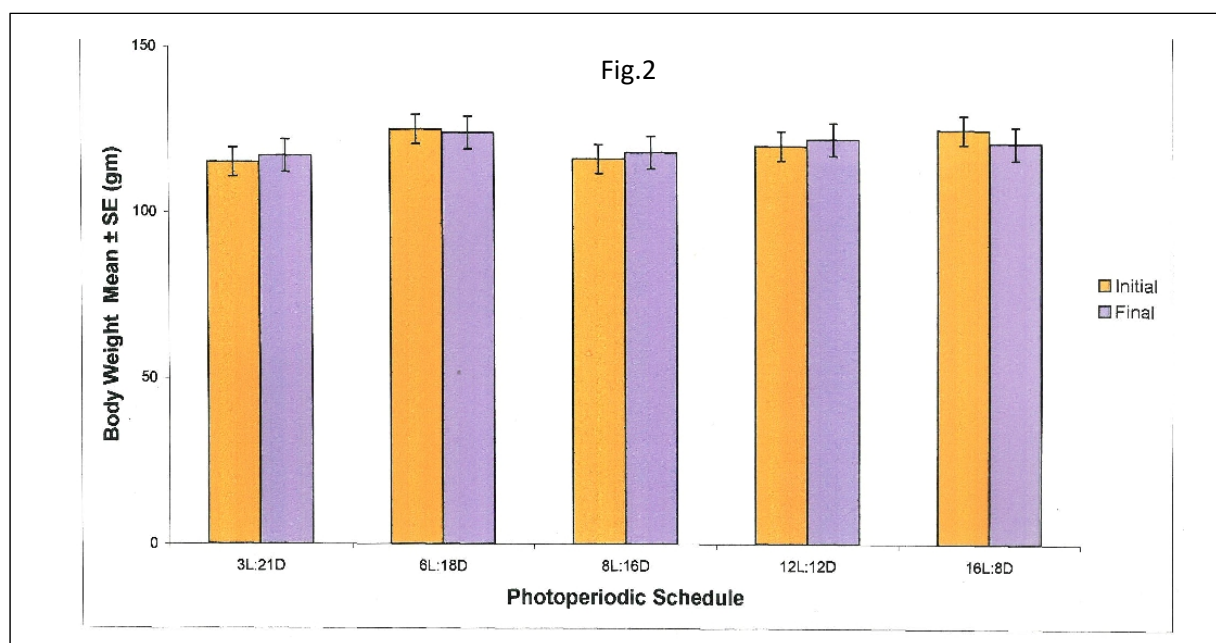


Figure showing the effect of photoperiods and testosterone on body weight (mean± SE) in rat.

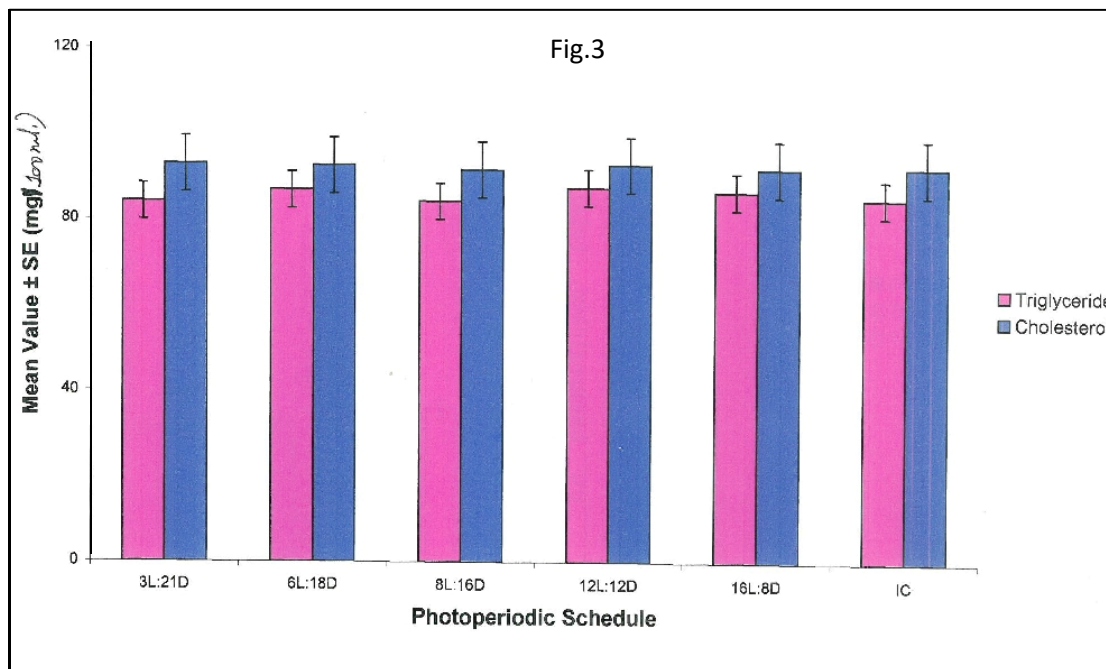


Figure showing the effect of different photoperiods treatments and testosterone on triglyceride and cholesterol (mean \pm SE) in rat.

TABLE NO. 3

Effect of photoperiod and testosterone on blood parameters

Photoperiod	Haemoglobin gm% (Mean \pm SE)	Total R.B.C. (Mean $\times 10^6$ /Cu.mm.)	Total W.B.C. (Mean $\times 10^3$ /Cu. mm.)
3L:21D	12.9 \pm 0.80	4.26 \pm 0.18	5.52 \pm 0.17
6L:18D	12.7 \pm 0.76	4.44 \pm 0.22	5.80 \pm 0.24
8L:16D	13.1 \pm 0.87	4.16 \pm 0.16	4.83 \pm 0.26
12L:12D	13.5 \pm 0.89	4.34 \pm 0.20	5.37 \pm 0.30
16L:8D	13.9 \pm 0.98	4.62 \pm 0.24	5.51 \pm 0.32
IC	13.3 \pm 0.91	4.73 \pm 0.23	5.09 \pm 0.21

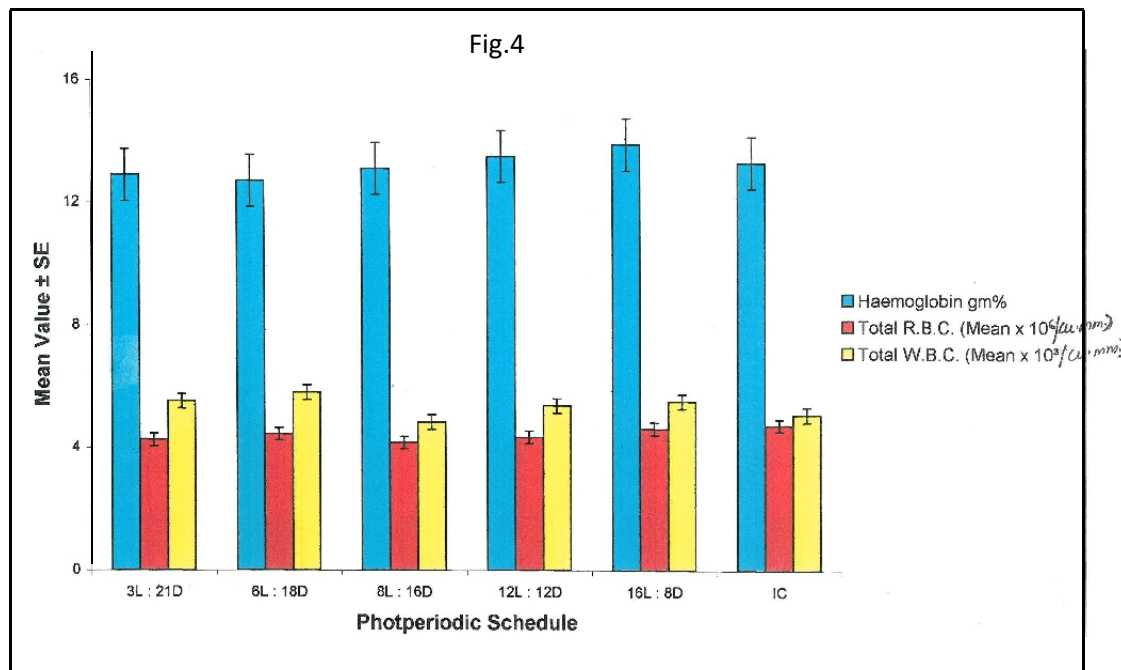


Figure showing the effect of different photoperiods and testosterone on haemoglobin, total R.B.C. and total W.B.C. (mean \pm SE) in rat.

Results

Effect on testis and accessory reproductive organs :

Testicular weight of the initial control group is compared with final testicular weight in all the photoperiodic schedules. There is significant difference among the groups of the different photoperiods and initial control group. The testicular response in 6L:18D, 6L:42D and 6L:66D groups was found significantly different ($P < 0.01$) as compared with the response in the 6L:6D, 6L:30D, 6L:54D and initial control. Fully grown seminal vesicle is observed in all groups and in the initial control group. The Epididymal weight of all the treated groups as well as initial control rats remain statistically at the same level (table1, fig.1).

Effect on body weight

Initial and final body weight of the rats does not change significantly after four weeks of drug treatment (table2, fig.2).

Effect on Lipid parameters

Lipid parameters such as triglycerides and cholesterol also show the similar trend and it is observed that the serum level of both triglycerides and cholesterol of different photoperiodically and drug treated groups as well as initial control group do not show any statistical difference (table2, fig.3).

Effect on haematological parameters

The analysis of the haematological parameters of different treated rats as well as initial control group show that the percent haemoglobin in all the groups remains statistically the same. Total R.B.C. count observed is also remain same among the drug treated groups and in the initial control group. Total W.B.C. number increased in all the photoperiodically and drug treated groups as compared with that of the initial control group (table3,fig.4)

It is observed that in the hormone treated group testicular growth is found significantly higher in 6L:6D, 6L:30D and 6L:54D which has behaved as longday as compared to 6L:18D, 6L:42D and 6 L:66D. The testicular growth is maximum in the 6L:6D group, but this increased weight is similar to the initial control group (fig.1).

The testosterone treatment was present in the experiment but along with diazepam. It is observed that there is no effect of diazepam on testicular response to testosterone under different resonance cycles. This might have happened perhaps due to the reason that diazepam could not alter the photoperiodic pathway of testosterone treated rats. Similar pattern of testicular response under resonance light cycles has been reported in many avian and mammalian species (Bunning, 1960; Malik et al, 2002; Turek, 1987).

The haematological parameters such as gram percent haemoglobin and R.B.C Count of various photoperiodically, hormonal and drug treated rats also remain the same, whereas the total W.B.C. Count increased in all the photoperiodically and drug treated animals as compared to the initial control (fig.4)

Discussion and conclusion

The investigation carried out in the present work has amply demonstrated the role of circadian system in the photoperiodic time measurement of a non photoperiodic mammal. The photoperiodicity is induced or expressed in the rats when treated with testosterone. Furthermore, the results with circadian tools provides strong support to the view that the ability to monitor the photoperiodic time in such non photoperiodic mammal depends upon the endogenous circadian photosensitivity rhythm.

The results of the various experiments performed under both normal 24hrs and non 24hrs photoperiodic schedules treated with testosterone and diazepam clearly indicate that the rats do not respond to the photoperiodic treatments and thus reproduce in non-photoperiodic environment. Testosterone sensitizes the animal to discriminate between a long and short photoperiod and thereby conditional reproductive photoperiodicity is induced in the rats. The results also reveal that the photoperiodic time measurement involves circadian photosensitivity rhythm. Such a rhythm of photosensitivity is probably entrained by the light alone because the administration of diazepam in the present study could neither alter nor induce the photoperiodic response of the rats under testosterone treatments. However the possibility of the action of such a potent psychoactive drug cannot be excluded at this instance.

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THE POERTY OF KAMALA DAS AND SYLVIA PLATH A COMPARATIVE ANALYSIS

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ABSTRACT

The purpose of comparative study of Kamala Das and Sylvia Plath is to find out common spaces in their poetry. It is surprising that the two poets, one born in Boston (USA) in 1932 and the other in a village in Kerala (India) in 1934 should have so much in common. In her poems we have Plath's vision of the plight of herself in a male dominated world. In the poem 'The Applicant' the poet is seen as a desexed object, a commodity for sale in a depersonalized and dehumanized society. The poems in 'Ariel' dealing with man-woman relations have been divested of the romantic trappings displayed by the poems written immediately after the poet's marriage with Ted Hughes. Love is presented as an unmanageable emotion characterized by distortions, suspicion, betrayal, bitterness, torture and even hatred. Her divorce drove her into a conclusive phase of disregard for men and society from which she alienated herself. Her vulnerability, concern for children. reaction to women's status and betrayal of her husband makes her a poet of confessional strain. The theme of alienation is also present in the poems written by her. Because of disillusionment and alienation from this physical world, she gives the note of protest with feminism in her poetry.

INTRODUCTION

Affirmation poetry explores personal details about the author's life without meekness, modesty or discretion. Confessional poetry emphasizes the intimate and sometimes unflattering information about quality details of the poet's personal life, such as in poems about illness, sexuality and despondence. Plath has often been regarded as a confessional poet, though her deeply personal lamentations often achieve universality through mythic allusion and archetypal symbolism.

Kamala is aware of both the beauties and cruelties of the male-body. She, like Sylvia Plath, is nearly disgusted with the ravaging lust of the male partner. The man is presented with scorn

and the poet's sexual union with him affords no satisfaction: rather it gives pain.

Kamala Das has faced frustration, disillusionment and drabness that she has expressed through every verse-line of her poetry in a bold, affirmative and confessional manner. A close study of her longer poems like 'Composition' reveal that she is a deeply distressed woman. As she remembers the frustrated bygone days of her married life; her feminine self, like a psychiatrist, begins to study the diseased- inner-self. Her feminine consciousness sinks, bit by bit, into the sea of sorrow. And it seems that her feminine self would not come out from the last layer of the sorrowful sea. She remembers the cold and dry days of married life; she complains of her man

and the tragic situation as she has stated in pessimistic poem 'Composition'. Her poetic self-reveals the pessimism throughout the poems.

Kamala Das' poetry speaks about the experiences she encountered through her bodily functions. For instance, she speaks of the "warm menstrual blood flowing" and "unfulfilled sexual fantasies". Her brash confessions, coupled with straightforward expression, are a distinctive quality of her poetry. The element of the body assumes importance here, but one shouldn't ignore the feelings trapped within that body. There are some more analogies between Kamala Das and Sylvia Plath. A version to the male principle of dominance, utter sexual subjugation and a desire to remain uninvolved are common to both of them.

Kamala Das nourishes a nostalgic fervour for the days and people left behind. Sylvia Plath also recalls with delight the time when she was little child and ran along the white hot beaches with her father. Plath is painfully disgusted at the loss of her identity and is reduced to a state when she very much in the manner of Kamala Das, only produces, 'mule bray, pig grunt and bawdy cackles'.

In Sylvia Plath's poetry, the suffering is vividly and intensely recalled as it is done in Kamala Das. Her poems lean on the cluster of associations and emotional implication with the past. The pangs of suffering as well as the hope of restoration are suggested through a formal structure, comprising rich ambiguities and subtle ironies. She reveals herself in all transparency and beauty. The poetry of both the poets can be seen as an exhibition of ironic self reflection in response to alienation and affirmation.

In the collection *Summer in Calcutta*, Kamala Das has been a

controversial figure, known for her unusual imagery and candour. In Poems, such as *The Dance of the Eunuchs* and *The Freaks*, Das draws upon the exotic to discuss her sexuality and her quest for fulfilment. In *An Introduction*, Das makes public traditionally private experiences, suggesting that women's personal feelings of longing and loss are part of the collective experience of womanhood.

The Dance of the Eunuchs objectifies, through an external, familiar situation, the poet's strangled desire within. It was written against the background of the poet's sudden contact with 'a man who had hurt me when I was fourteen years old; she wanted to get him at any cost.' *The Freaks* is about 'a grand flamboyant lust'. *In Love* brings the poet face to face with the question whether she could call her sexual experience 'love'. *In Winter* also carries the warmth of the sexual act of her soul 'groping for roots 'in his body.

In the collection *The Descendants*, the poem *The Maggots* frames the pain of lost love with ancient Hindu myths, while the poem *The Looking Glass* suggests that the very things society labels taboo are the things that women are supposed to give.

Poems like *'Suicide'*, *'Substitute'*, *'The Invitation'* and *'Composition'*, reveal the death burdened psyche of the self. They project, by and large, the self's confrontation with the complex emotional restlessness caused by the new recognition that despite the positivity of 'body's wisdom' the body itself is the subject to decay. Her feminine self

goes deep into her own self-revealing mysteries and that experience of frustration sets the psyche in the attitude of rebellion.

I must pretend
I must act the role
Of happy woman
Happy wife
(*The Descendants*
p. 2)

In *The Old Playhouse* and *Other Poems*, poems such as '*Substitute*,' '*Gino*,' and '*The Suicide*' examine physical love's failure to provide fulfilments, escape from the self and exorcism of the past.

O sea, i am fed up
I want to be simple
I want to be loved
And
If love is not to be had,
I want to be dead, just dead

(*The Suicide*)

whereas poems such as '*The Inheritance*' address the integrity of the artistic self in the face of religious fanaticism. In the '*Prisoner*' Das compares herself to the convict who studies his prison's geography with distrust and hope.

The title poem, '*Ariel*,' displays a forceful move from darkness to light that has been interpreted as a woman speaker transforming herself into the male image of the arrow. The poet's ongoing fascination with death is sounded in many of the *Ariel poems*, including '*Edge*,' which presents a vision of a

dead woman holding two dead children and noting the women's 'smile of accomplishment' The starkly direct poems in *Ariel*-many of which were written in the months and weeks prior to Plath's death -address similar subjects to those in *The Colossus*. Critics have pointed out that psychic distress issignalled through brutal self-revelation, violent imagery, and macabre associations.

The poems in '*Ariel*' dealing with man-woman relations have beendivested of the romantic trappings displayed by the poems written immediately after her marriage with Ted Hughes. Love is presented as an unmanageable emotion characterized by distortions suspicion, betrayalbitterness, torture and even hatred.

In [1940](#), when Sylvia was eight years old, her father died as a result of complications from diabetes. He had been a strict father, and both his authoritarian attitudes and his death drastically defined her relationships and her poems- most notably in her elegiac and infamous poem, '*Daddy*' Plath's obsession with the symbol of the father figure, who is treated with scorn and rage but who is also invoked as a muse. Plath presents the protagonist suffering from Electra complex in '*Daddy*'

There's a stake in your fat
black heart
And the villagers never liked
you.
They are dancing and stamping
on you.
They always knew it was you.
(*Daddy, line 76*)

It would be safe to attribute the speaker's depressive thoughts, and haunting images, to feelings that she is bound to her father's memory

despite the anger and resentment that she feels. Using this type of association one can feel the animosity with which Plath writes of her father, as distinct from her father in the flesh. On an unconscious level, Plath could blame her father for leaving she and her mother alone.

'*Lady Lazarus*' features the poet's conflict with '*Herr Doktor*'. It represents a struggle against male dominance that ultimately ends in defeat. The poem's central metaphor, the resurrected Lazarus from the Bible, has often been read as a reference to a woman who has survived several suicide attempts. The closing declaration of the woman's ability to 'eat men like air' sounds a note of revenge against the male figure the speaker identifies as her '*Enemy*.' Plath addresses a feeling of alienation and futility in the face of male domination.

Out of the ash
I rise with my red hair
And I eat men like air.
(*Lady Lazarus* line 82-84)

Critics have observed that Plath's first poetry collection, *The Colossus*, displays an overriding preoccupation with estrangement, motherhood, and fragmentation within contemporary society. The collection demonstrates Plath's mastery of traditional literary forms while bearing the influence of confessional poets such as Robert Lowell and Anne Sexton.

As is evident from the above discussion, Kamala Das and Sylvia Plath have many things in common despite their birth and upbringing in countries which are culturally different from each other. Both are undisputably confessional poets par excellence. They rebelled against their family and society and gave a befitting reply to male chauvinism. For both, love is an unmanageable

notion characterised by distortion, suspicion, betrayal, bitterness, torture and even hatred. Their divorce drove them into a phase of disregard for men and society from which they alienated themselves. Their vulnerability, reaction to women's status and betrayal of their husband go a long way to make them poets of confessional strain. Both faced frustration, disillusionment and drabness which they express through their poetry in a bold, affirmative and confessional manner.

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Article

GRAHAM GREENE : A STUDY OF HIS ART AND IDEAS

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Whether Graham Greene Is a 'Catholic Writer' or 'a writer who is Catholic' has been the cause of much comment by various critics. His conversion from Anglicanism to the Roman Catholic Church encouraged the view that his novels should be studied as paradigms of Catholic theology. Though Greene himself

Our interests on the dangerous edge of things. The honest thief, The tender murderer, The superstitious atheist, demi-rep. That loves and saves her soul in new French books- we watch while these in equilibrium keep the giddy line of midway.

This passage catalogues what is more characteristic in Greene's work -- the precarious moral equilibrium, of the characters between tenderness and murder, honesty and thievery, between sanctity and sin. These characters who stay on the giddy line of midway are important because through them Greene tries to evaluate the moral meaning and importance of human act. Therefore, the importance of characters like the honest thief and the tender murderer is that they define the world discarded from the presence of God. In the epigraph to *The Lawless Roads*, Greene says, "What shall be said to this reason - bewildering fact? I can only answer that either there is no Creator, or the living society of men is in a true sense discarded from His presence." Therefore, the situations in which his characters are entangled become the metaphors of the human condition and suffering, which has been summed up by Marie - Beatrice Mesnet:

Lost in a strange world, unhappy, suffering from his destiny, and in doing so becomes conscious of an interior division. He is existence and essence, a thinking and an empiric self. The working of his consciousness in felt as a dissociation of his being.

This explains the position of the protagonist of almost Greene's every novel. When he is not actually a fugitive the protagonist feels that he is a misfit, an outsider, who does not really belong. Graham Greene bares the very soul of his characters and tells us of an experience and a situation which are rather common. His protagonist knows what is right, he wants to do what is right, and yet somehow, he can never do it. He knows what is wrong, and yet, somehow, he does it. He feels himself to be a split personality. He feels himself pulled in two directions. He is haunted by this feeling of frustration- his ability to see what is good and his inability to do it, his ability to recognise what is wrong and his inability to do it, his ability to recognise what is wrong and his inability to refrain from doing it. This human situation is exactly what Seneca talked to as "our helplessness in necessary things." This chasm between the inner and the outer man which was explored by Greene in his seminal novel *The Man Within*, is depicted with greater insight and subtlety in the later novels from *The Power and the Glory* to **The Comedians**.

This enduring value lies in Greene's awareness of sin, in his recognition of evil a necessary creative principle and in his acceptance of the brutal, the unsavoury side to a meaningful existence. Is Greene pessimistic? A mystified quester, a Sisyphean seeker cannot be accused of pessimism. His "pessimism", if at all, is the recognition of our reality that is truth, of truth that is our reality. Greene imparts to his readers a sense of unease, uncertainty and limitedness. His vision admits of no facile satisfactory resolution of human travail - with the crucial question of how a God who is supposed to have created the world out of love, can condone suffering and expect to be loved in return. Greene, with unfaltering vision, has postulated an intolerable

God who does expect it and does not allow us to pervert ourselves without damnation. Hence the confusion, the obscurity, the paradoxes in Greene's works. The ordinary man will have to take - Him on trust: the Catholic will have a greater intimacy with the twists of the lamp and will be less inhibited by its cruelty if he absorbs orthodoxy. Greene is of two species: he is neither here nor there. He cannot but remind Us of Dante. But Greene knows that a virtuous man can almost cease to believe in Hell though he carried Hell about with him. Virtue or piety Paves the path to the hocus-pocus of perfectibility, to an eyeless metaphysical delusion. That way, Greene suggests his damnation not redemption. He relentlessly, even ruthlessly explored a private world of corrosion and decay, invested with evil, apparently God-forsaken, but finally redeemed by God.

We are made to face and come to terms with pessimism and frustrations of Greene's men and women: one of his deepest intuitions is the predicament which invariably enforces upon man the necessity or some conclusive action. A Greene hero responds and reacts partly to collective forces of society and partly to his own moral intuitions. The conjunction of the forces within and without produces the sense of an invisible necessity which seems to govern the actions of the protagonist at crucial moments. He is impelled by his childhood experiences, by a religious moral code or by obsessive fears and desires. What is to be noted is that he acts and feels morally responsible for the consequences of his actions. J.P. Kulshrestha aptly remarks:

The freedom of Greene's protagonist is severely limited by their own compulsive actions and reactions and also by chance encounters and happenings. They have a curious "stillness" in that they are haunted like ancient heroes by a sense of fatality. Greene conveys through his protagonists his own sense of inexorability, his ironic awareness of pendulum about to swing. This does not, however, mean that Greene swallows determinism whole. There is at any rate no 'stark casualty' in his novels, howsoever marred the lines of his characters may be. Even Pinkie, whose every move seems predetermined, is not ultimately denied the freedom

to choose God instead of the devil. Others too, like the Whisky Priest, Scobie and Sarah, Querry and Plarr are at some time or the other allowed an act of free will (not with-standing an implacable pattern unfolding in their lives) to reject past commitments and to transcend the confinements of human condition.

Relevant to the above view, Martin Turnell makes a perceptive observation:

These, then, are factors which determine the quality of the religion in the work of Graham Greene. It would be wrong to close our eyes to its shortcomings and unfair not to try to understand the reasons for them, or to withhold our gratitude for what he and other contemporary Christian writers have done for us. For whatever his shortcomings or his limitations in this world of the Christian novelist has one lesson of immense importance to teach us all. He does remind us on every page that human beings, however vilely they behave, have immortal souls, that the alternatives salvation-damnation are the greatest reality, indeed the only reality, in the world.

By the exploration of the absurd and the irrational, Greene arrives at a positive meaning of life. As Dr. Plarr puts it in *The Honorary consul*, "Life is absurd. Because it's absurd, there is always hope."

Undoubtedly Greene presents the constant reevaluation of the self undergone by the protagonist. By focussing on his failures the protagonist becomes aware of his weaknesses. He may be remorseful, but his remorse is at the acceptance of things which are contrary to the values and laws imposed by society and religion. Thus the awareness of failures and weaknesses lead to suffering, conflict, soul-searching tension, in short, to the recognition of the self, which can only help him by making him dissatisfied with the devil. And Greene suggests that his awareness of guilt is the hero's path to redemption. No man, howsoever vile, is lost for ever. Redemption is possible. Even the fallen man can redeem himself and the sinner (the hunted man) can still relate himself to others. He can belong.

अनैतिक व्यापार निवारण अधिनियम 1956 का प्रवर्तन समस्याएँ एवं समाधान

संजुष सिंह भदौरिया

प्राचार्य

राजीव गांधी महाविद्यालय, भोपाल

संतोष कुमार भदौरिया

सह-प्राध्यापक

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मण्डीदीप भोपाल

सार संक्षेप

नगरीकरण एवं औद्योगिकीकरण से न केवल महिलाओं के यौन उत्पीड़न की घटनाओं में वृद्धि हुई है अपितु अनैतिक व्यापार की प्रवृत्ति को भी बढ़ावा मिला है। आज वेश्यावृत्ति चरम सीमा पर है सम्पन्न वर्ग इसे विलासिता का साधन मानता है तो निर्धन वर्ग इसे अपनी विवशता बताता है। शिक्षित एवं सम्पन्न व्यक्ति भी वेश्यावृत्ति को व्यवसाय मानकर चला रहे हैं। इसी पर नियंत्रण पाने के लिये 1956 में स्त्री तथा लड़की अनैतिक व्यापार (दमन) अधिनियम पारित किया गया। 1986 में संशोधन कर इस अधिनियम का शीर्षक “अनैतिक व्यापार (निवारण) अधिनियम 1956 कर दिया गया है। इस अधिनियम में कुल 25 धाराएँ हैं जो निवारक प्रावधान प्रस्तुत करती हैं। ये धाराएँ वेश्याओं के लिये दण्डक नहीं हैं। यह अधिनियम एक सामाजिक अधिनियम है। अर्थात् इसके प्रावधान महिलाओं के संदर्भ में सुधारात्मक है।¹

परिचय:-

स्वतंत्रता के बाद हमारे समाज में महिलाओं एवं बालिकाओं के समर्थन में बनाये गये कानून महिलाओं में शिक्षा के विस्तार व उनकी आर्थिक स्वतंत्रता के बाद असंख्य महिलाएँ अब भी अनैतिक व्यापार की शिकार हैं, औद्योगिकीकरण, भूमण्डलीयकरण के कारण ये समस्या राष्ट्रीय स्तर पर ही नहीं अपितु अन्तरराष्ट्रीय स्तर पर भी विद्यमान है। महिलाएँ गरीबी के कारण नारकीय जीवन जीने के लिये बाध्य हैं। अतः वे अनैतिक व्यापार की ओर उन्मुख हो जाती हैं। देह व्यापार को अक्सर वेश्यावृत्ति से जोड़कर ही देखा जाता है लेकिन ट्रेफिकिंग का मानव देह व्यापार के दायरे में बंधुआ मजदूरी अश्लील साहित्य या मर्जी के खिलाफ कम पैसों पर कार्य करने को मजबूर करना भी शामिल है। महिलाओं के साथ अनेक प्रकार के अपराध हो रहे हैं, जैसे महिलाओं को शारीरिक, मानसिक यातनाएँ देना उनके साथ मारपीट करना, शोषण करना, नारीत्व को कलंकित करना, भूखा प्यासा रखना, उन्हें अनैतिक व्यापार की ओर धकेलना, दहेज की बलि पर चढ़ा देना आदि।²

भारतीय संविधान के अनुच्छेद 35 में भारत की संसद को कानून बनाने की शक्ति प्रदान की गयी है। अनैतिक व्यापार के संबंध में कुछ राज्य में कानून अस्तित्व में थे लेकिन उनके प्रावधान एक से नहीं थे। परिस्थितियों के मद्देनजर यह आवश्यक था कि एक केन्द्रीय विधान बनाया जाए, जो न केवल एक समान हो अपितु उसमें पर्याप्त सुधारात्मक उद्देश्य भी हों। विधेयक का एक विशिष्ट गुण यह भी था कि राज्य सरकार के

सिवाय कोई व्यक्ति या प्राधिकारी संरक्षा गृह स्थापित नहीं करेगा। राज्य सरकार को लाइसेंस देना होगा।

पद्यतिशास्त्र:-

शोध की मुख्यतः दो पद्यतियाँ होती हैं:-

1. सैद्धांतिक पद्यति ।
2. असैद्धांतिक पद्यति ।

प्रस्तुत शोध पत्र में असैद्धांतिक शोध पद्यति का प्रयोग किया गया है। निर्वचन में बाह्य सहायताओं का प्रयोग किया गया है। अर्थात् अनुभव पर आधारित शोध पद्यति को अपनाया गया है।

उद्देश्य:-

प्रस्तुत शोध पत्र में अनैतिक व्यापार के प्रवर्तन में क्या-क्या समस्याएँ आती हैं का अध्ययन शोध पत्र के माध्यम से किया गया है एवं समस्याओं के समाधान का भी अध्ययन किया गया है। यह अधिनियम पूर्णतः दण्डक नहीं है अपितु यह एक सामाजिक विधान है। जिसका उद्देश्य पीड़ितों का पुनर्वास एवं महिला को सुधारना है। अधिनियम का उद्देश्य व्यापारिक उद्देश्य के लिये लैंगिक भोशण को दण्डित करने का है। अधिनियम का महत्वपूर्ण उद्देश्य महिलाओं, पुरुषों और बच्चों के दुर्व्यापार को रोकना।

अधिनियम का विधायी इतिहास:-

विश्व के सभी देशों में महिला एवं पुरुषों के शोषण से मुक्ति के लिये कानूनों की आवश्यकता थी क्योंकि शोषण

से समाज के व्यक्तियों के स्वास्थ्य एवं नैतिकता को खतरा रहता है। इसके लिये 1937 में लीग ऑफ नेशन ने एक ड्राफ्ट तैयार किया। 1950 में संप्रेशन ऑफ ट्रेफिक इन परसन एण्ड ऑफ दि एक्सप्लाइडेशन ऑफ दि प्रोस्टीट्यूशन अन्तरराष्ट्रीय प्रसंविदा पर विभिन्न देशों द्वारा व्यक्तियों के अनैतिक व्यापार (दमन) के लिये न्युयार्क में 9 मई 1950 को हस्ताक्षर किये। भारत के गजट में इसे विधेयक के रूप में 1954 में कारण और उद्देश्य के सहित प्रकाशित किया गया। इस विधेयक को राष्ट्रपति की सहमति 30 दिसम्बर 1956 को प्राप्त हुई। धारा-1 के प्रावधानों को राष्ट्रपति ने अपनी अनुमति से 31 दिसम्बर 1956 से लागू कर दिया और बाकि सभी धारायें 1 मई 1958 से प्रभाव शील हुई।

अधिनियम को स्त्रियों तथा लड़कियों का अनैतिक व्यापार (दमन) अधिनियम 1956 के नाम से जाना गया। इसका उद्देश्य महिलाओं एवं लड़कियों में वेश्यावृत्ति की बुराई को समाप्त करना था एवं समाज की वेश्यावृत्ति में गिरी हुई महिलाओं के पुर्नवास एवं सभ्य व्यक्ति के समान अवसर प्रदान करना। इसका संक्षिप्त नाम सीटा था।

लड़कियों तथा स्त्रियों का अनैतिक व्यापार (दमन) अधिनियम 1956 में अभी तक दो बार संशोधन किये गये हैं –

1. 1978 में – स्त्री तथा लड़की का अनैतिक व्यापार (दमन) अधिनियम 1978– 46– 1978
3. 1986 में – स्त्रियों तथा लड़कियों का अनैतिक व्यापार (दमन) अधिनियम 1986 – 44–1986³

अधिनियम की प्रवर्तन की समस्याएं:-

अधिनियम वेश्यावृत्ति जैसी सामाजिक बुराई को रोकने के लिये अस्तित्व में है। वर्तमान युग नारी उत्थान का युग है। वेश्यावृत्ति जैसी सामाजिक समस्या से सुरक्षित करने और एक स्वस्थ समाज की कामना हेतु यह अधिनियम प्रकाश में आया। अनैतिक व्यापार (निवारण) अधिनियम 1956 के प्रवर्तन के संबंध में प्रवर्तन की मुख्य समस्याएं निम्नलिखित हैं:-

1. पुलिस के अन्वेषण में मुख्य समस्या प्रत्यक्ष साक्ष्य के अभाव की है। पुलिस की कार्यवाही सिर्फ परिस्थितियों के आधार पर होती है। साक्ष्य के अभाव में लक्ष्य की प्राप्ति नहीं की जा सकती।
2. गवाहों की अनुपलब्धता – अधिनियम के प्रवर्तन की सबसे बड़ी रुकावट है वेश्यावृत्ति के अपराध में गवाह उपलब्ध नहीं होते। किसी भी अधिनियम के प्रभावी प्रवर्तन के लिये गवाहों की गवाही की महत्वपूर्ण भूमिका होती है।
3. अनैतिक व्यापारियों (जिसमें दलाल, वेश्यागृह चलाने वाले, मालिक, वेश्यावृत्ति की आय पर निर्भर रहने वालों) को यदि पुलिस द्वारा पकड़ लिया जाता है तो उन्हें जमानत बहुत जल्दी मिल जाती है। दूसरे महिला को चाहे वह अपनी इच्छा से ही इस व्यापार में लिप्त है सह अपराधी नहीं बनाया जाता है।
4. कई बार प्रथम सूचना प्रतिवेदन करने पर भी पुलिस प्रभावी कार्यवाही नहीं करती अर्थात पुलिस स्वयं उदासीन एवं अज्ञानी बनी रहती है।

5. अपर्याप्त पुलिस बल के कारण अधिनियम का प्रवर्तन ठीक प्रकार नहीं हो पाता 8.9 प्रतिशत स्थान पुलिस विभाग में रिक्त है। कई बार पुलिस स्टेशनों पर एक ही व्यक्ति की नियुक्ति के कारण वेश्यावृत्ति की कार्यवाही नहीं हो पाती है।
6. जैसे-जैसे मामला पुलिस द्वारा आगे बढ़ाया जाता है तो अधिवक्ता भी अपने नैतिक आचरण को ताक पर रखकर अपनी प्रक्रिया सही तरीके से पूरा नहीं करते झूठे गवाह बनाकर अपराधियों को सजा से मुक्त अधिवक्ता करा देते है।
7. न्यायालयीन परीक्षण में देरी होने के कारण भी अधिनियम की प्रवर्तनशीलता प्रभावित होती है। इसमें मुख्य रूप से न्यायालयों में कार्य की अधिकता स्टॉफ की कमी, अभियुक्त तथा उसके अधिवक्ता की अनुपस्थिति, दस्तावेजों का अभाव न्यायाधीश एवं मजिस्ट्रेट की उदासीनता एवं उपेक्षा आदि के कारण अधिनियम का प्रवर्तन अपना प्रभाव नहीं छोड़ पाया।
8. दण्डिक प्रावधान यद्यपि अधिनियम में दिये गये है लेकिन फिर भी मजिस्ट्रेट द्वारा निश्चित दण्ड न दिये जाने से दण्ड में अनिश्चितता रहती है और अपराधियों के मन में दण्ड की निश्चितता नहीं रहती है।
9. अपराधियों को राजनीतिज्ञों द्वारा प्रक्षय दिये जाने के कारण उनके खिलाफ मामला बनता ही नहीं है यदि बनता भी है तो भी उनको जमानत मिल जाती है इसका कारण हमारी सामाजिक संरचना है।
10. भ्रष्टाचार, नैतिकता और व्यवस्था का कैंसर है। जिस तरह कैंसर शरीर की प्रतिरोधक क्षमता को कम कर देता है वैसे ही भ्रष्टाचार विधिक शक्तियों को समाप्त कर देता है।
11. कुछ परम्परागत जातियों, (जिसमें मुख्य रूप से बेड़िया, बौछड़ा एव सांसी है) में वेश्यावृत्ति को व्यवसाय के रूप में चुने हुए है दूसरा इन जातियों के क्षेत्र को अधिसूचित भी नहीं किया गया है। अतः जातिगत वेश्याओं पर भी अधिनियम के प्रवर्तन का कोई औचित्य नहीं है क्योंकि इन जातियों में इसे अनैतिक नहीं मानते बल्कि अपने व्यवसाय के रूप में मान्यता देते है।
12. अनैतिक व्यापार अधिनियम के अंतर्गत जो अपराधी व्यक्ति अपराध करते हैं। वे श्वेत पोश अपराधी होते है। अतः समाज की साधारण जनता इनके खिलाफ मुंह नहीं खोल पाती है। जब इनकी आपराधिकता बाहर नहीं आयेगी तो अधिनियम का प्रवर्तन कैसे होगा।
13. कानून की जानकारी का अभाव या अनभिज्ञता विधायिका ने कानून का निर्माण तो कर दिया लेकिन उसका ज्ञान व्यक्तियों को नहीं है शोधार्थी का मत है कि अशिक्षित ग्रामीण जनता को ही नहीं, वकील, लोकअभियोजन में जुड़े लोगों, पुलिस अधिकारियों को भी इसकी जानकारी नहीं होती है।

14. प्रकृति में गोपनीय होने के कारण अधिनियम अपनी भूमिका नहीं निभा पा रहा है।
15. हमारे अंदर जागरूकता का अभाव है अनैतिकता समाज में किसी भी रूप में हो रही हैं। हम अपनी व्यक्तिवादी सोच के कारण एवं उससे जब तक कि स्वयं प्रभावित नहीं हो रहे हैं। उसकी तरफ ध्यान ही नहीं देते कि अधिनियम बना हुआ उसके प्रवर्तन की दिशा में कोई प्रभावी कार्यवाही नहीं करते हैं।
16. कानून में दण्ड की पर्याप्त व्यवस्था होने के बाद भी साक्ष्य के अभाव में अपराधी दण्ड से मुक्त हो जाते हैं। दण्ड का भय लोगों को नहीं रहता।
17. चिकित्सकों का समय पर नहीं मिलना या घटना स्थल से चिकित्सालय दूर होने के कारण भी अधिनियम के क्रियान्वयन में परेशानी आती है।⁴

उपरोक्त के अलावा अधिनियम को प्राथमिकता नहीं दिया जाना, संवेदनशीलता में कमी, पीड़ित का उत्पीड़न, अनुपयुक्त अन्वेषण, आँकड़ों का अभाव, परस्पर सहयोग की कमी, गैर सरकारी संगठनों के साथ समन्वय की कमी, सराहना की कमी एवं वेश्यावृत्ति से मुक्त महिलाओं के पुनर्वास व्यवस्था का उचित न होना भी अधिनियम के प्रभावी प्रवर्तन की समस्या है। इस प्रकार उपरोक्त सभी समस्याएं अधिनियम से प्रत्यक्ष अप्रत्यक्ष रूप से जुड़ी हुई हैं एवं अधिनियम के प्रवर्तन में रूकावट डालती है।

महिला उत्पीड़न रोकने के सामाजिक उपायः—

स्त्रियों की सामान्य प्रतिष्ठा, शिक्षा, प्रभावी वैधानिक उपायों परीक्षण और रोजगार के अवसर देकर सुधारी जा सकती है। उपरोक्त वैध एवं तर्क संगत उपाय महिलाओं के अनैतिक व्यापार को कम करेंगे। जनसंचार माध्यमों में महिलाओं के विरुद्ध हिंसा को सेन्सर करने के नैतिक और मानवतावादी कारण लेकिन हमारे पास कोई ऐसा प्रमाण नहीं है कि ऐसी कार्यवाही से अनैतिक व्यापार रूक जायेगा। ये उपाय सामाजिक प्रभावों के लिये वांछनीय हो सकते हैं। परन्तु हमें यह विश्वास नहीं हो सकता कि वे किस सीमा तक महिलाओं के व्यापार को रोक सकते हैं। यह मालूम करने के कोई प्रमाण नहीं है कि कौन-सी नीतियों को प्राथमिकता दी जाए। फिर भी कई ऐसे उपाय हैं जिनके किये जाने से महिलाओं का उत्पीड़न कम हो सकता है।

1. महिला संगठन, राजकीय एवं निजी सार्वजनिक संस्थाओं द्वारा पीड़ितों की सुरक्षा, मदद और सलाह की आवश्यकताओं की पूर्ति की जा सकती है। महिलाओं के आश्रय की आवश्यकता को सभी स्वयंसेवी संस्थाओं द्वारा प्रचारित किया जा सकता है।
2. पीड़ित महिलाओं को रोजगार ढूँढने उनके बच्चों की देखभाल की सुविधाओं को उपलब्ध कराने और अस्थायी रूप से वित्तीय सहायता दिलवायी जानी चाहिये। इस उद्देश्य के लिये परामर्श केन्द्र केन्द्रीय स्थान पर खोले जा सकते हैं।
3. शोषण की शिकार महिलाओं के लिये सस्ती और कम औपचारिक अदालतों की स्थापना भी एक उपाय हो सकता है।

इसका आशय यह नहीं कि अदालतें केवल महिलाओं के ही मामले निपटायेगी। इनका कार्य क्षेत्र और विस्तृत होना चाहिये। अदालतें ऐसी होनी चाहिये जिसमें जज, मजिस्ट्रेट और वकील स्त्रियों के मामलों की जानकारी और उनमें रूचि रखते हों तो यह महिलाओं के हित में होगा। इससे कानून व्यवसाय में स्त्रियों की संख्या बढ़ जायेगी एवं पीड़ित महिला को यह संतोष रहेगा कि उनकी वकील या जज या पुलिस अधिकारी महिला हैं और वह अपनी व्यथा को निर्भिकता से कह पायेगी। और महिलाओं के समक्ष उपस्थिति होने में उन्हें प्रसन्नता होगी कि महिलाएँ उनकी समस्याओं को समझने में अधिक सक्षम होगी।

4. स्वयंसेवी संगठनों को महिलाओं की निजी समस्या के बारे में पुलिस अदालतों या संबंधित व्यक्तियों से बात करना आवश्यक है। महिलाओं के एक समूह द्वारा महिलाओं के दुख के विरुद्ध आवाज उठाई जाती है तो वे अपने विचारों को दृढ़तापूर्वक व्यक्त कर सकते हैं।

5. ऐसे संगठनों का प्रचार होना चाहिये जो महिलाओं को निःशुल्क कानूनी सहायता देते हैं। जिससे कि पीड़ित स्त्रियाँ उनके पास जाकर सहायता मांग सकें।

6. महिलाओं के माता-पिता के विचारों में भी परिवर्तन की आवश्यकता है। जिन कारणों से महिला अनैतिक अपराधों की ओर बढ़ती है। जब माता-पिता को अपनी लड़कियों के उत्पीड़न के बारे में मालूम होता है तो उन्हें समाज की परवाह किये बिना पुलिस कार्यवाही से लेकर न्यायिक कार्यवाही करनी चाहिये।

7. अन्त में महिला की स्वयं की भूमिका भी अत्यंत महत्वपूर्ण हैं। महिला को किसी दबाव अत्याचार (अनैतिक दुर्व्यापार) के आगे नहीं झुकना चाहिये। महिलाओं को समझना चाहिये कि अनैतिक कार्यों से दूर रहकर भी बच्चों की एवं अपनी देखरेख कर सकती है। महिलाओं को अपने अधिकार पर दृढ़ रहना और अपने लिये नई भूमिका स्वीकार करना एवं जीवन की ओर एक आशावादी दृष्टिकोण अपनाना चाहिये।⁵

अनैतिक व्यापार निवारण हेतु सुझावः—

महिलाओं के अनैतिक अपराधों के निराकरण के लिये विधि प्रवर्तन अभिकरण, पुलिस को प्रभावशील एवं संवेदनशील बनाने की आवश्यकता है। जहाँ कानून एवं न्यायालय से समस्या का समाधान नहीं हो सकता वहाँ पर वेश्यावृत्ति या अनैतिक अत्याचार रोकने के लिये समाज की साहसिक पहल आवश्यक है। जैसा कि अधिनियम का नाम है अनैतिक व्यापार (निवारण) अधिनियम 1956 है लेकिन इस अधिनियम में अनैतिक अपराधों में किन-किन अपराधों को रखा जाये स्पष्ट नहीं है। अनैतिक व्यापार (निवारण) अधिनियम 1956 के प्रवर्तन की यदि हम बात करें तो यह अधिनियम वेश्यावृत्ति के अंकुश पर अपना प्रभाव नहीं छोड़ पाया है अनैतिक व्यापार शोधार्थी के विचार से अधिनियम में कहीं भी “अनैतिक” शब्द को ही स्पष्ट नहीं किया है कि अनैतिकता में किन-किन उपबंधों को शामिल किया जाये। शोधार्थी ने अध्ययन करने पर पाया कि यह अधिनियम सिर्फ वेश्यावृत्ति को ही केन्द्रित करता है।

1. अनैतिक व्यापार को स्पष्टतः परिभाषित किया जाना।
2. वेश्यावृत्ति को बंद करने का स्पष्ट निर्देश अधिनियम

में नहीं है।

3. कानून एवं विधि व्यवस्था में अपेक्षित सुधारों की आवश्यकता।
4. शिक्षा का प्रसार।
5. जन जागरूकता कार्यक्रमों को प्रोत्साहन।
6. अधिवक्ताओं का सहयोग।
7. पुलिस का सहयोग।
8. गवाह को हर प्रकरण पर सम्मान दिया जाये।
9. गवाहों का परीक्षण शीघ्र किया जाये।
10. समय पर एवं समुचित खर्चा दिलवाया जाए।
11. अभियुक्त द्वारा भय या प्रलोभन के संबंध में कानून सख्त बनाया जाये।
12. अत्याधिक विलम्ब को कम किया जाए।
13. न्यायालय के कर्मचारियों एवं अधिकारियों का सहयोग।
14. अनैतिक व्यापार अधिनियम की हानियों का प्रचार करना।
15. प्रक्रिया सरल एवं बोधगम्य हो।

मानव दुर्व्यापार विरोधी मुहिम में राष्ट्रीय स्तर पर तेजी आई है। इसमें अनेक हित धारक व्यक्ति और संस्थाएं शामिल हैं जैसे—मीडिया, कारपोरेट संस्थाएं, कानून का प्रवर्तन कराने वाली सरकारी संस्थाएं, मानव अधिकार संगठन, उद्योग समूह, विशिष्ट व्यक्ति, राजनीतिक नेता आदि।

दाण्डक कार्यवाही के लक्ष्य को लेकर अनैतिक व्यापार (निवारण) अधिनियम 1956 के अन्तर्गत राज्य शासन द्वारा कुछ क्षेत्रों को परिलक्षित “वेश्यावृत्ति निरोधक क्षेत्र” घोषित कर अधिसूचना जारी की गई। साथ ही त्वरित कार्यवाही करने के लिये कुछ विशिष्ट पुलिस अधिकारियों को “विशेष पुलिस अधिकारी” नियुक्त कर जारी की गई। महिला थानों को भी अधिनियम के अन्तर्गत कार्यवाही हेतु अधिसूचित किया गया है।

निष्कर्ष :-

प्रस्तुत भाषण पत्र में भारत के अनैतिक व्यापार की क्या स्थिति है? अनैतिक व्यापार को कहाँ-कहाँ किस रूप में परिभाषित किया है का अध्ययन है। प्रस्तुत अधिनियम में अनैतिक व्यापार के अंतर्गत मुख्य रूप से वेश्यावृत्ति सम्मिलित है। वेश्यावृत्ति पर ही अधिनियम के प्रावधान केन्द्रित हैं।

यदि हम यह जानने की कोशिश करें कि अनैतिक व्यापार क्यों किया जाता है तो 80 प्रतिशत महिलाओं की वेश्यावृत्ति के लिये ही अनैतिक उपयोग किया जाता है। घरेलू काम, बच्चों को अवैध गोद देना, शरीर के अंग बेचने के लिये, भीख मांगने के लिये, बंधुआ काम के लिये एवं मादक वस्तुओं का व्यापार कराने के लिये 20 प्रतिशत महिलाओं का उपयोग किया जाता है। कारण स्पष्ट है कि महिलाएं व्यापार कराने वालों की दृष्टि में ज्यादा सुरक्षित हैं और आसानी से महिलाओं को न तो पकड़ा जाता है और न ही उन पर शक किया जाता है अतः अनैतिक व्यापार कराने के लिये महिलाओं एवं लड़कियों का उपयोग किया जाता है।

अनैतिक व्यापार से ऐसा नहीं महिलाएं आर्थिक रूप

से संपन्न होती है या उनकी जैविक आवश्यकताओं की पूर्ति होती है बल्कि महिलाओं एवं लड़कियों को अनैतिक व्यापार से बहुत सी जोखिम भी उठाना पड़ती है। इसमें मुख्य रूप से स्वास्थ्य की जोखिम इसमें एच.आई.वी. एड्स, गर्भपात, बार-बार बालिकाओं का गर्भित होना, मादक पदार्थों की आदतें, मानसिक रूप से तनावग्रस्तता, शारीरिक सुरक्षा का खतरा, पुलिस अधिकारियों द्वारा गिरफ्तारी की आशंका, सामाजिक जीवन के एकीकरण के प्रवेश में कठिनाई मुख्य है।

अनैतिक व्यापार निवारण नियंत्रण के आगमन के पश्चात् भी वेश्यावृत्ति की समस्या में कोई कमी नहीं आ रही है। इस जटिल समस्या के कारण किशोर बालिकाएँ वेश्यावृत्ति में लिप्त हो जाती हैं। अनैतिक व्यापार (निवारण) अधिनियम वेश्यावृत्ति की समस्या का पूर्णतः समाधान करने में प्रभावी भूमिका निभाने में सफल नहीं रहा है। वेश्यावृत्ति की बुराई को समाप्त करने हेतु अन्य विधायी मापदण्डों की अपेक्षा है।

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अनैतिक व्यापार निवारण अधिनियम-1956 की न्यायिक समीक्षा

संजुष सिंह भदौरिया

प्राचार्य

राजीव गांधी महाविद्यालय, भोपाल

संतोष कुमार भदौरिया

सह-प्राध्यापक

राजा भोज शासकीय महाविद्यालय

मण्डीदीप भोपाल

सार संक्षेप

किसी भी स्वतंत्र जनतात्रिक देश में न्यायपालिका का विशिष्ट स्थान होता है। न्यायपालिका संविधान की एवं संविधान के अधीन निर्मित किसी भी अधिनियम की प्रासंगिकता निर्धारित कर रक्षा करती है। तथा व्यक्तियों एवं नागरिकों के अधिकारों को किसी भी प्रकार के अतिक्रमण से बचाती है। लोकतंत्रात्मक देशों में न्यायपालिका को एक पवित्र संस्था के रूप में स्वीकार किया गया है। भारतीय संविधान में न्यायपालिका को एक स्वतंत्र, निष्पक्ष और सम्मान पूर्ण स्थान प्रदान किया गया है। विश्व के सभी देशों में महिला एवं पुरुषों के भोक्षण से मुक्ति के लिये कानूनों की आवश्यकता थी क्योंकि शोषण व्यक्तियों के स्वास्थ्य एवं नैतिकता के लिए खतरा होता है, व्यक्तियों के अनैतिक व्यापार दमन के लिये अनैतिक व्यापार (दमन) अधिनियम 1956 प्रभाव में आया।

परिचय:-

मूल्यों की श्रृंखला में सबसे महत्वपूर्ण मूल्य न्याय का है। न्यायालय एक ऐसी संस्था है जो व्यवस्था में आस्था एवं विश्वास जागृत करती है। अनेक स्थानों पर न्यायपालिका विभिन्न धाराओं की व्याख्या करते-करते एक पृथक संवैधानिक विधि शास्त्र का निर्माण करती है। एवं सरकार के सफल संचालन का मार्ग प्रशस्त करती है। अनेक बार न्यायपालिका की भूमिका यथावत रहती है क्योंकि इसके निर्णय में मूलपाठ का ही अर्थ किया जाता है, किन्तु अनेक बार न्यायपालिका ने सृजनात्मक भूमिका भी निभाई है न्याय व्यवस्था की सक्रियता और संवैधानिक मूल्यों के प्रति अटूट आस्था आकर्षण लगती है।

अनैतिक व्यापार निवारण अधिनियम 1956 के संदर्भ में सामाजिक न्याय की संकल्पना अपना विशिष्ट स्थान रखती है। सामाजिक न्याय संविधान का मुख्य लक्ष्य है। न्यायपालिका से यह आकांक्षा की गई थी कि वह भारत में सामाजिक आर्थिक क्रान्ति की भुजा बने इसका अर्थ है कि लोगों में सामाजिक आर्थिक जीवन के परिवर्तन में विद्यायी दृष्टि कोण को प्रभावी बनाने के लिये न्यायालयों द्वारा समर्थन अनिवार्य है।

भारत के उच्चतम न्यायालय एवं राज्यों के उच्च न्यायालयों को पुनरीक्षण पुनर्विलोकन और अपील का मौलिक क्षेत्राधिकार प्राप्त है। भारतीय संविधान के अनुच्छेद 32 में उच्चतम न्यायालय एवं अनुच्छेद 226 के अन्तर्गत उच्च न्यायालयों एवं अपील में विभिन्न लेखों द्वारा जनहित याचिका दायर की जा सकती है। न्यायालय न्यायिक सक्रियता एवं स्वविवेक से

दुर्व्यापार के मामलों में नये आयाम, नई नीतियां कार्यक्रम और सुधारात्मक पहलुओं पर निर्णय देते हैं।

उद्देश्य:-

अनैतिक व्यापार निवारण अधिनियम 1956 के उद्देश्य निम्नलिखित हैं:-

- (1) महिलाओं, पुरुषों और बच्चों के दुर्व्यापार को रोकना।
- (2) अधिनियम का उद्देश्य व्यापारिक उद्देश्य के लिये लैंगिक शोषण को दण्डित करने का है।
- (3) यह अधिनियम पूर्णतः दाण्डिक नहीं है अपितु यह एक सामाजिक विधान है। जिसका उद्देश्य पीड़ितों का पुनर्वास एवं महिला को सुधारना है।
- (4) वेश्या एवं वेश्यावृत्ति को समझना तथा निवारण हेतु उपाय बताना।
- (5) इस अधिनियम का उपबंध संज्ञेय है तथा बिना वारन्ट तलाशी लेने का भी अधिकार है।
- (6) यह एक केन्द्रीय विधान है। अधिनियम में व्यापक उद्देश्यों को ध्यान में रखा गया है।

इस अधिनियम द्वारा राज्यों को व्यापक शक्तियाँ दी गई हैं। जिससे के वे वेश्यावृत्ति पर नियंत्रण एवं अंकुश लगा सकें। यह अधिनियम उन स्त्रियों के लिए अत्याधिक सहायक सिद्ध हुआ है, जो स्वयं वेश्यावृत्ति से मुक्ति पाना चाहती हैं। अधिनियम लागू होने के बाद भारत में स्त्री सुरक्षा गृह, अल्पावधि गृह, जिला आश्रय गृह खोले जा चुके हैं।

पद्यतिशास्त्र:-

प्रस्तुत शोध पत्र में अनुभववाश्रित शोध पद्धति का प्रयोग किया गया है। उच्चतम न्यायालय एवं उच्च न्यायालय के निर्णयों को शोध पत्र में जोड़ा गया है जो कि विधि में प्राथमिक संकलन के रूप में माने जाते हैं। उच्चतम न्यायालय के निर्णय आगामी प्रकरण के निर्णय तक विधि का प्रभाव रखते हैं। जो कि पूर्व निर्णय के रूप में विधि के श्रोत के रूप मान्य है।

उच्चतम न्यायालय एवं उच्चन्यायालय द्वारा निर्णीत निर्णय की विवेचना:-

अनैतिक व्यापार (निवारण) अधिनियम 1956 एक सामाजिक विधान है समाज में व्याप्त अनैतिकता को समाप्त करना अधिनियम का उद्देश्य है न्यायालयों ने अपने निर्णयों में सामाजिक आर्थिक न्याय पर जोर दिया है। अधिनियम में महिलाओं के लिये पर्याप्त संरक्षात्मक उपबंध है। न्यायालय ने उदार निर्वर्चन के सिद्धान्त को अपनाया है। न्यायालयों ने अपने निर्णयों में महिलाओं की विधिक सहायता, अभिरक्षा, पुनर्वास, महिला को वे यावृत्ति से हटाने एवं संरक्षण गृह में उचित देखभाल के निर्देश राज्य सरकार को दिये हैं। देव दासी, वैकटेशन जोगिन आदि प्रथाओं को समाप्त करने के निर्देश उच्चतम न्यायालय ने विभिन्न सरकारों को दिये हैं।

इस प्रकार न्यायालयों द्वारा महिलाओं एवं अवयस्कों के हित संवर्धन के निर्णय दिये गये हैं। अधिवक्ताओं और गैर सरकारी संगठनों की भूमिका पर भी न्यायालय ने ध्यान केन्द्रित किया है। इनसे सहयोग की अपेक्षा न्यायालय द्वारा की गई है। न्यायालय ने संविधान के अनुच्छेद 21 के अन्तर्गत मानव गरिमा को बनाये रखने के लिये बच्चों के सामाजिक, आर्थिक, मनोवैज्ञानिक विकास पर जोर दिया है। एवं बच्चों को गरिमामय जीवन जीने के लिये पर्याप्त सुख सुविधाओं का ध्यान राज्य सरकार देगी।¹

न्यायाधिपति सुब्बाराव के अनुसार:- “किसी अधिनियम के निर्वर्चन अधिनियम के आदर्शों, आकांक्षाओं एवं उद्देश्यों को ध्यान में रखकर किया जाना चाहिये।”

अनैतिक व्यापार (निवारण) अधिनियम 1956 एवं भारतीय संविधान के अनुच्छेद 19(1) छ वृत्ति वाणिज्य एवं व्यापार की स्वतंत्रता का आपस में विरोध नहीं है। अनैतिक व्यापार के व्यवसाय को कोई अधिकार के रूप में दावा नहीं कर सकता है। वेश्यावृत्ति व्यवसाय के रूप में मान्यता नहीं दी जा सकती है। इस पर संविधान के अनुच्छेद 19(2) के अन्तर्गत युक्तियुक्त निर्बंधन लगाये जा सकते हैं।²

उत्तर प्रदेश सरकार द्वारा वेश्याओं के बर्हिगमन आदेश को वैध करार करते हुए न्यायालय के स्पष्ट किया कि वेश्यावृत्ति लोक नैतिकता के लिये घातक और सार्वजनिक स्वास्थ्य के लिये हानिकारक है अतः सार्वजनिक हित में वेश्या को एक क्षेत्र से बाहर जाने का आदेश दिया जा सकता है।³ कोई विशेष स्थान वेश्यागृह के लिये अनुमत है या नहीं सिद्ध करने का भार अभियोजन पर है कि वह स्थान या परिसर किसी व्यक्ति के लाभ के लिये या दो वेश्याओं के लाभ के लिये प्रयोग हो रहा है।⁴

जिन महिलाओं एवं स्त्रियों का उपयोग अनैतिक व्यापार के लिये किया जाता है तो वे दण्ड के दायित्वधीन नहीं हैं। क्योंकि अधिनियम के प्रावधान महिलाओं के लिये संरक्षात्मक हैं। दण्डात्मक नहीं।⁵

वेश्यावृत्ति के साक्ष्य मिलने पर अधिनियम की धारा 3 के अन्तर्गत कार्यवाही होगी।⁶

इस प्रकरण में न्यायालय ने कहा कि सम्पत्ति का अन्तरण या स्थान का अन्तरण अनैतिक उद्देश्य के लिये नहीं किया जा सकता क्योंकि अनैतिक उद्देश्य के लिये सम्पत्ति का अन्तरण लोकनीति के विरुद्ध है। अतः लोकनीति के विरुद्ध अन्तरण वैध नहीं होते।⁷

न्यायालय ने कहा कि धारा (7) के अनुसार सार्वजनिक स्थलों में धार्मिक पूजा स्थल शैक्षणिक संस्थानों, अस्पतालों पर वेश्यावृत्ति पर रोक लगाती है यह विधायिका का आशय है। कि इन स्थानों पर अनैतिक गतिविधियाँ शामिल न हो क्या सार्वजनिक क्षेत्र के 200 मीटर के बाहर की वेश्यावृत्ति मान्य है ? यहां पर न्यायालय ने कोई स्पष्ट निर्देश नहीं दिये हैं।⁸

न्यायालय ने निर्धारित किया कि धारा 13 (3) के तहत विशेष पुलिस अधिकारी अन्वेषण करेगा एवं अधीनस्थ पुलिस अधिकारी की सहायता भी करेगा तलाशी लेने सूची बनायेगें साक्ष्य एवं कथनों का रिकार्ड बनायेगें।⁹

बिना वारन्ट गिरफ्तारी का अधिकार:-

इस अधिनियम के अधीन अपराधों को संज्ञेय अपराध माना गया है। वारन्ट के बिना गिरफ्तारी विशेष पुलिस अधिकारी द्वारा या उसके निर्देशन एवं मार्गदर्शन में ही की जायेगी। गिरफ्तारी आदेश लिखित में दिया जायेगा जिसे कि आवश्यकता पडने पर दिखाया जा सके।¹⁰

स्त्री या लड़की को अन्तरिम अभिरक्षा दिये जाने से पूर्व स्त्री अथवा लड़की को सुना जाना आवश्यक है। प्राकृतिक न्याय के सिद्धान्तों का पालन आवश्यक है।¹¹

एक संरक्षण गृह से दूसरे संरक्षण गृह में अन्तरित करने की शक्ति महिला कल्याण को दृष्टिगत रखते हुए की गई है।¹²

न्यायालय का कथन है कि कोई अव्यस्क लड़की है तो उसकी इच्छा अथवा पिता की इच्छा के विरुद्ध उसे संरक्षा गृह में नहीं रखा जा सकता है।¹³

वेश्या को किसी स्थान से हटाना निश्चित रूप से जनता पर हानिकारक प्रभाव डालने से रोकना है। सूचना प्राप्त होने पर मजिस्ट्रेट का स्वविवेक है कि प्राप्त सूचना के आधार पर अपनी भाक्ति का उपयोग करे मजिस्ट्रेट का कार्य न्यायालय का कार्य है।¹⁴

उच्चतम न्यायालय ने मामले के तथ्य एवं परिस्थितियों पर विचार करते हुए मानवीय दृष्टिकोण अपनाते हुए कहा कि बच्चे भारत का भविष्य हैं इस पौध को इस तरह पल्लवित एवं पुष्पित किया जाये कि वे एक वृक्ष के रूप में हमारे सामने आयें। उच्चतम न्यायालय ने बाल कल्याण के लिये निम्नलिखित दिशा निर्देश दिये:-

(1) बच्चों के शारीरिक, मानसिक एवं बौद्धिक विकास के प्रयास किये जाने चाहिये।

- (2) संरक्षण गृहों में बाल कल्याण अधिकारी की नियुक्ति की जानी चाहिये जो बाल मनोविज्ञान का विशेषज्ञ हो।
- (3) बाल गृहों, संप्रेषण गृहों, रिमाण्ड गृहों में बालकों के पुनर्वास की समुचित व्यवस्था होनी चाहिये।
- (4) बाल गृहों में बच्चों की शिक्षा—दीक्षा, प्रशिक्षण पालन पोषण की समुचित व्यवस्था की जानी चाहिये।
- (5) बाल गृहों में पीठासीन अधिकारियों की नियुक्ति की जानी चाहिये।
- (6) बच्चों को समाज में लौटाने योग्य होने पर समाज के सुपुर्द किया जाना चाहिये।¹⁵

उच्चतम न्यायालय ने वेश्याओं तथा अन्य गिरी हुई महिलाओं के बच्चों के संरक्षण एवं पुनर्वास के लिये अनेक दिशा निर्देश जारी किये गये हैं। और कहा कि महिलाओं को वेश्यावृत्ति से उवारे उन्हें गरिमामय जीवन व्यतीत करने के लिये सहायता प्रदान करें शिक्षा, वित्तीय सम्पत्ति, बाजार सुविधाओं से स्वरोजगार के अवसर प्रदान करें। न्यायालय ने यह भी निर्देश दिया कि गृह निर्माण, विधिक सहायता, निःशुल्क अधिवक्ता की सहायता इसी प्रकार की अन्य सहायताएं एवं सेवाएँ यह सुनिश्चित करने के लिये है कि अगामी पतित महिलाएँ कुत्सित वातावरण में पुनः न पड़ जायें¹⁶

अवयस्कों को वेश्यावृत्ति व्यवसाय से छुड़ाकर उनके पुनर्वास के आदेश सरकारी अभिकरणों को न्यायालय द्वारा दिये गये कि उन बालिकाओं का चिकित्सीय परीक्षण कराया जाये कि वे किसी बीमारी से ग्रसित तो नहीं हैं।¹⁷

उपरोक्त निर्णय स्वागत योग्य है न्यायालय ने बालिकाओं के हित संबर्धन की बात कही।

रेडलाइट एरिया के व्यक्तियों के समाज में पुनः समायोजन एवं पुनर्वास व्यवस्था के आदेश न्यायालय द्वारा दिये गये।¹⁸

इस मामले में न्यायालय ने सामाजिक आर्थिक सशक्तिकरण से संबंधित विचार व्यक्त किये। वेश्याओं के बच्चों को गरिमामय जीवन जीने देने के लिये पर्याप्त सुख सुविधाएँ सरकार को देनी चाहिये। संसद को वेश्याओं एवं बच्चों को ध्यान में रखते हुए कानून बनाना चाहिये।¹⁹

न्यायालयों ने महिलाओं एवं अवयस्कों के सामाजिक आर्थिक सशक्तिकरण के विभिन्न सिद्धान्तों को प्रतिपादित किया है। न्यायालय के समक्ष आये प्रकरणों में न्यायालयों ने महिलाओं के हित में निम्नलिखित बातों पर जोर देकर राज्य सरकारों को निर्देश जारी किये हैं—

- (1) मानव दुर्व्यापार का अर्थ।
- (2) सार्वजनिक स्थान का परिभाषित किया जाना।
- (3) सार्वजनिक हित में वेश्यावृत्ति व्यवसाय पर युक्तियुक्त निर्बंधन के निर्देश।
- (4) विशेष पुलिस अधिकारी की नियुक्ति का आदेश।
- (5) महिलाओं की अंतकालीन अभिरक्षा।
- (6) अभियुक्त का बिना बारन्ट गिरफ्तारी
- (7) महिलाओं को वेश्यावृत्ति से हटाना।
- (8) पीडित महिलाओं का विधिक सहायता।
- (9) पीडित महिलाओं के पुनर्वास के आदेश।

- (10) महिलाओं को मुख्य धारा में लाने के निर्देश।
- (11) महिलाओं एवं अवयस्कों के चिकित्सीय परीक्षण के निर्देश।
- (12) आर्थिक रोजगार के अवसर प्रदान करने के निर्देश।
- (13) महिलाओं को समाज के मुख्य धारा में लाने के निर्देश।
- (14) संरक्षण गृहों एवं किशोर गृहों में किशोर को उचित देखभाल के निर्देश।
- (15) बच्चों के प्रकरणों में “चाइल्ड फ्रेन्डली” संकल्पना को अपनाया जाना।

निष्कर्ष:—

उच्चतम न्यायालय द्वारा अनुच्छेद 32 एवं उच्च न्यायालय द्वारा अनुच्छेद 226 के अन्तर्गत लोकहित वाद के माध्यम से, लोककर्तव्य प्रवर्तन, सामाजिक न्याय संरक्षण, विधि शासन के प्रवर्तन एवं संरक्षण, बालकल्याण, बंदी कल्याण वेश्यावृत्ति उन्मूलन, पर्यावरण संरक्षण, प्राकृतिक न्याय आदि संकल्पनाओं पर महत्वपूर्ण आयामों में हस्तक्षेप कर सकारात्मक भूमिका निभाई है। वेश्यावृत्ति या शोषण के विरुद्ध संरक्षण एवं संवर्धन के लिये भारतीय न्यायपालिका की भूमिका सजग प्रहरी की है।

सर्वोच्च न्यायालय द्वारा जो कुछ निर्णय दिये जाते हैं। वह भारत के लिये कानून है। अनैतिक व्यापार निवारण अधिनियम 1956 एक सामाजिक विधान है। राज्य का यह दायित्व है कि वह निर्धन एवं साधनहीन वर्ग को समर्थ एवं शक्तिशाली वर्ग के शोषण से बचाये। सामाजिक न्याय संविधान की आत्मा है। न्यायपालिका संविधान का गतिशीलता प्रदान करती है।

इस अधिनियम के लागू होने से अनैतिक, असामाजिक, अश्लील किस्म के कार्य करने वालों के मन में डर व्याप्त हुआ है अनैतिक व्यापार की डर में कमी आई है। कानून के डर से महिलाओं के घृणित कार्य में संलग्न होने पर पाबंदी लगी है।

विधि की व्याख्या तथा वैद्यता का परीक्षण न्याय प्रशासन करता है। उच्चतम न्यायालय के निर्णय सामाजिक प्रगति में सहायक होते हैं। प्रगतिशील निर्णयों के कारण सामाजिक न्याय की संकल्पना को मजबूती मिली है।

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Impact on Growth, flowering and yield of chilli (Capsicum Annum L.)

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ABSTRACT

Chilli is one of the major spices grown in MP. Field trials were conducted at the Krishi Vigyan Kendra Badwani adopted villages during the Kharif season of 2011-12 to 2014-15 and it was found that the growth and yield of chilli variety JM-218 was significantly influenced by the quality of seedlings especially total number of days spent in nursery. The present trial quantified that seedlings of the age of 25 days lead to highest yield of 134.40 q/ha while seedlings of the age of 40 days resulted in significantly lower yield of 86.70 q/ha.

INTRODUCTION

Guna district is well known for spice crop production, Vegetable and spice in every Indian cuisine and is grown throughout the country. Pungent forms are used as green chilli, whole dry chilli, chilli powder, chilli paste, chilli sauce, chilli oleoresin or as mixed curry power. Dried fruits are extensively used in spice. Chilli is an important spice which is grown throughout India. It is usually grown by transplanting of seedlings either in July- August or in February-March. However in Kharif chilli is grown commercially in north Bihar for its disposal in dried form. The growth and yield of this spice is affected by the quality of seedlings especially total number of days spent in nursery. Since there is scanty research information on the subject present trial was carried out to quantify the effect of age of the seedlings on the growth, flowering and yield of chilli variety JM-218 which is a commercial variety of this region.

LAND PREPARATION

Soil should be prepared to a fine tilth by 2-3 ploughings. FYM should be incorporated in soil at the time of final ploughing. Ridges and furrow are prepared at 45-60cm distance. Seedlings are transplanted in levelled land in plots of

convenient size for irrigation.

SEEDLING PREPARATION

1.0-1.5kg seeds sown in an area of three cents is required to raise seedlings to plant in one hectare. Generally 40-45 days old seedlings are transplanted. Clipping of capsicum and chilli seedlings about 10 days prior to transplanting helps to accelerate growth of axillary buds and results in better branching.

VARIETIES

JM 218 : Yield 7.5t/ha of green chilli. Plants dwarf and bushy. Fruits 9-10cm long, curved, thin, light green colored.

NUTRIENT MANAGEMENT

Application of 20tonnes of FYM and 120kg N, 40-60kg P₂O₅ and 20-40kg K₂O are recommended in majority of states. FYM is applied by broadcasting at the time of final ploughing. Spot application of FYM in furrows or at the point of planting is also followed by farmers. Full dose of P and K and half dose of N is applied 10-15 days after transplanting.

WATER MANAGEMENT

Timely irrigation is essential especially for fruit set and development. The irrigation is required at every third /4th day during summer while in winter, it should be 7-8 days interval. For row planted crop, drip irrigation is advantageous and fertilizer can be supplied through drip irrigation.

HARVESTING

Chilli is harvested by hand picking and harvesting extends up to two months. Farmers usually take one or two harvests for green chilli purpose even if crop is raised for dry chilli purpose. Yield of fresh green chilli is 3-4 times more than that of fresh red ripe chilli and 6-10

times than that of dry chilli. Yield under rainfed and an irrigated condition varies considerably. Green chilli: 10-15 t/ha and Dry chilli: 1-1.5t/ha

MATERIAL AND METHODS

Before intervention of KVK, the farmers raised seedlings of hybrid chilli in traditional way. Germination was very low (65%). KVK barwani demonstrated hi-tech way of seedling production (production of seedling trays filled with coco peat under protected structure) during 2009-10. After the success of intervention of KVK, Shri Jaydev Patidar , village Anjad adopted this technology in 2011-12. The table above shows the production and benefit from 2011-14.

Year	Crop	No. of seedlings produced	Total Cost (Rs in Lac)	Net Profit (Rs in Lac)
2014-15	Chilli	2500000	12.5	12.5
	Cabbage	200000	1.0	1.0
	Tomato	200000	1.0	1.0
	Cauliflower	200000	1.0	1.0
	Brinjal	100000	1.0	0.5
2013-14	Chilli	1500000	8.0	7.0
	Capscicum	100000	0.5	0.5
	Hyb. tomato	100000	0.4	0.6
2012-13	Hybchilli	1800000	12.6	5.40
	Capscicum	300000	2.5	0.5
2011-12	Hybchilli	1000000	5.0	5.0
	Capscicum	50000	0.35	0.15
	Tomato	40000	0.20	0.20



Experiment was carried out at the Krishi Vigyan Kendra during Kharif season of 2011-12 to 2014-2015. The 15, 20, 25, 30, 35 and 40 days old seedlings were transplanted on 7, 12, 17, 22 and 27 July and 1 August 2014 (6 treatments) at a spacing of 45 x 30 cm in plots of size 2.7 x 2.1 m. The experiment was replicated 4 times. All the treatments were given identical cultural practices as per package of practices for Kharif chilli (Maurya and Singh 1984). Data were recorded on

plant mortality, plant height, number of branches/plant, number of leaves/plant, days to 50 per cent Maurya et al Seedling age influence on chilli flowering, number and weight of fruits per plant and yield of red ripe fruits/hectare.

Germination - starting chilli seeds

1. Heat : Like all seeds, chilli seeds are reasonably easy to germinate. Initially, their main requirement is heat. Obviously, it is best if

possible to keep the seeds indoors, if not in a house or garage, then at minimum in a greenhouse. Even when they are in a centrally heated house there are things you can do to maximise the heat. Try putting the seed tray in warm spots such as on top of the fridge or in an airing cupboard. Alternatively, you could buy a heat pad from a garden centre and place the tray on top. This will ensure a constant warmth is supplied to the chilli.

2. Moisture: During germination, moisture helps the seeds by softening the pods from which they sprout. Pre-soaking the seeds in warm water (not hot) prior to planting in compost can help speed up the germination process. If you have the seeds in a warm area as suggested in tip 1 above be sure to not let the planting medium dry out. Try and keep the medium moist to touch but not wet. A small water mister is best to use rather than pouring water straight into the seed tray.

3. Planting : You can plant the seeds straight into individual pots however a seed tray will allow you to plant more in a confined space. Fill the tray 3/4 full of fine compost (sieved if possible). Then add the seeds in straight lines leaving about 5cm between seeds. Next, sieve over another 3-5mm of compost. Be sure to label the seeds if more than one variety is being grown. Place a cover over the tray and place somewhere warm.

4. Thinning Out: The seeds should sprout after anything from a few days to a few weeks. You should try and leave the seedlings in the seed tray until they have sprouted their first true set of leaves (the second set that appears). It is a good idea at this time to throw away any weak looking plants and only pot on the strongest plants. This of course, depends on how much space you have available to grow them, just remember they take up a lot more room once they are fully grown plants!

RESULTS and DISCUSSION

Maximum plant mortality of 23.5 and 21.6 per

cent was observed in case of plants grown from seedlings of 40 and 35 days of age respectively the two being at par with each other followed by 10.0 per cent in case of plants grown from seedlings of 30 days. Maximum plant height (65.10 cm) was observed in seedlings planted after 15 days and minimum (41.20 cm) in 40 days seedlings; number of primary branches/plant was 10.8, 8.7, 7.6, 6.8 and 6.5 in plants grown from the seedlings of 25, 20, 30, 35 and 15 days all being statistically at par and minimum (4.2) in plants of 40 day old seedlings; secondary branches per plant were 18.6, 14.5 and 12.6 in the plants from 25, 20 and 30 days seedlings respectively all being at par. The higher number of leaves was 945.25, 816.15, 750.25 and 690.80 in the plants from 25, 20, 15 and 30 days seedlings respectively all being statistically at par and lower in from 35 and 40 days old seedlings (635.40 and 603.44 respectively). No significant differences were recorded wrt to the days to 50 per cent flowering. Maximum (184) number of fruits/plant were recorded in case of plants from 30 days old seedlings and minimum (96 and 98) in 40 and 35 days old seedlings respectively.

Maximum weight of fruits per plant (201.88 g) and fruit yield (134.40 q/ha) were recorded in the plants from 25 day old seedlings which were statistically different from all other treatments.

Lim and Wong (1975) and Maurya(1990) reported that young chilli seedlings were more vigorous in vegetative growth particularly in top growth and flowered and fruited earlier than those transplanted at older days. Shukla et al (2011) also observed that 3-4 week old seedlings produced more vegetative growth, flowered early and produced higher yield than those transplanted at 5, 6 and 7 weeks age. Hence transplanting of seedlings at the age of 25 days is beneficial for getting early and higher yield of chillies in subtropical monsoon climate of north Bihar.

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Assessment of soybean products in Gird Zone of M.P.
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ABSTRACT

This study set out to assess the extent of soybean products acceptability and consumption in Gird Zone of M.P. Random sampling was used to collect data from 150 respondents using descriptive tools, such as mean, frequencies and percentages and like scaling. Research questions were formulated and utilized. In addition related literatures were reviewed in relation to the knowledge base of the people about the processing and utilization of soybean products. Data collected were analyzed and the result show that soybean products have been accepted and consumed by a great number of people for the fact that its nutritive value have been made known to them. Some people have been educated on the processing and using of soybean products in different ways through interactions with fellow human beings and mass media like television. Available soybean products were found to include soybean powdered milk, soybean liquid milk and soybean flour. Some soybean products such as soybean oil, soybean cake and soybean meal were not available. It was recommended that food specialist extension workers should be sent to rural areas in order to educate the rural people on the methods of processing those soybean products that are not available in the area. Secondly, government should provide the rural people with facilities needed for the processing of these products such as grinding mills and expellers at subsidized rates as well ad and develop markets for soybean products to enable the people take advantage in the commercialization of these processed products to promote rural development.

INTRODUCTION

Soybean is one of the most important crops in Guna district. It is a versatile grain legume because it has a variety of uses. Soybean is rich in protein, vegetable oil and essential minerals. This crop has the ability to fix atmospheric nitrogen and therefore, improves soil fertility. Soybean is increasingly becoming popular and serving as an alternative food and cash crop. The area under soybean production as well as productivity are increasing in Guna due to government policies on value addition, domestic use and crop diversification. Consequently, there is a significant expansion of the soybean industry within Guna and with substantial demand for export market. Despite its importance and potential, the crop faces a number of major challenges which include short shelf life, poor crop production practices, diseases particularly soybean rust and effects of climate change. However, the Directorate of Soybean Research (DSR) through the soybean improvement

program in collaboration with its partners such as International Institute of Tropical Agriculture (IITA) has responded and continue to search for sustainable solutions to these challenges by developing suitable soybean varieties adaptable in most agro ecologies in Guna and has developed appropriate agronomic messages to address and manage some of the challenges.

However, studies by Ogunidipe and Osho (1990) and Osho et al. (1994) have shown that despite the high nutritional value of soybean relative to other legumes, lack of knowledge of its uses has limited its adoption, consumption and production in Non-traditional areas of cultivation. Meanwhile, Africa's serious malnutritional problem is especially acute in terms of protein deficiency. The soybeans protein have been developed for use in hospital diets, particularly for post – operative diets and soybean flour protein concentrates and isolates have been

incorporated into infant foods, such as rice-and – wheat based foods, in order to increase protein content. The soy flour is used to make bread, pudding, pancakes, soup thickener and other foods.

Problem Statement

Soybean has been used as food for centuries because of its good nutritive value. According to Singh et al. (1987) and Weingartner (1987), the bean has about 40% protein content and contains about 20% by weight of edible oil. In addition, the bean is rich in vitamins, minerals and acids.

Soy-protein has been developed for use in hospital diets particularly for post-operative diets and soy flour protein concentrates and isolates have been incorporated into infant food as rice to increase their protein contents. The realization of the good nutritive value of soybean by the Indians food scientists necessitated the awareness campaign mounted by the various arms of government in recent times to educate the populace on the processing, production and consumption of the soybean products. This notwithstanding, it was deemed necessary to answer the following research questions:

- To what extent have people been educated on the processing, use and importance of soybean products?
- What are the processed soybean products available for consumption in most rural communities in Gird Zone?
- To what extent have people consumed and accepted soybean products in Gird Zone In order to address these pertinent issues, the assessment of soybean product acceptability and consumption in Gird Zone was carried out.

Objectives of the Study

The primary objective of this research is to assess the level of soybean products acceptability and consumption in Guna district. The specific objectives are to:

1. Describe the socio-economic characteristics of soybean farmers/producers and marketers Guna district.
2. Identify and describe the various types of soybean products and their uses in the study area.

3. Assess the knowledge base of the people in the locality about processing and utilization of soybean products.
4. Determine the level of acceptability and consumption of soybean products in the area.
5. Identify the problems/constraints in processing and use of soybean products.
6. Make recommendations based on the findings of the study.
- 7.

Acceptability of Soybean

Soybean (*Glycine Max L.*) is a legume that grows in tropical, subtropical and temperate climates. Approximately half of the world's soybeans are produced in the developing world, and the other half in the developed world. It is believe that soybean is one of the oldest crops grown by man.

Since then, soybean production consumption and acceptability have continued to increase. The numbers of soybean farmers also increased tenfold to about 500,000 though the entire soybean they produced are being used domestically. Osundahunsi et al. (2007) said that acceptability of soybean products has been enhanced by modification of processing methods. Today, soybean is planted on more than 70 million acre annually in the US more than any other single crop except corn (in most years; (NASS, 2003).

Processing of Soybean Products

Soybean can be processed into different products such as soybean oil, soybean meal/cake, soymilk, soybean fortified 'gari' and tapioca, soy- ebiripo, soy-tortilla and cereal-based traditional weaning food etc. Variations in processing methods also yield a host of co-product. Soybean processing involves series of steps to produce commodities for food, industrial and animal feed uses.

These include:

- (i) Threshing
- (ii) Transport from fields to the threshing or drying sites and to store houses or to collection centres and finally to processing industries where they are processed into different products.
- (iii) Drying
- (iv) Cleaning or elimination of impurities and debris from the harvested crops,
- (v) Packaging
- (vi) Storage

(vii) Final processing into other products (Dugje I.Y et al., 2009).

Soy-milk Processing

According to the author, soymilk is made by soaking soybeans over night in water, drain, rinse and discards the water. In a food processor or blender, process beans with water until smooth. Strain into a pot through a double layer of a fine sieve. Add ginger and sugar to taste. Boil soymilk for about 20 minutes. Stir frequently to prevent skin from forming. Remove ginger, then flavor with vanilla. Stir in sugar to taste. Cool to room temperature, then refrigerate. The milk is a white or cream emulsion which resembles cow milk (Conventional milk) in both appearance and consistency. Osundahunsi et al. (2007) revealed that acceptability of soybean products has been enhanced by modification of processing methods. Some of the modified soymilk extraction method includes application of heat, soaking of soybean in ethanol or alkali and acid grinding. Iwe and Agu (1993) suggested the use of natural flavorings to improve soymilk production.

Soybean Flour Processing

Soybean flour is prepared by picking whole soybean grains boiled for about 25 minutes, hand peeled to remove the peels and sun dried for 2 days, and ground into flour.

RESEARCH METHODOLOGY

Area of the Study : The study was done in Villages under the Guna district of M.P.

Geography : **Latitude:** 23.53⁰-25.07⁰

Longitude: 76.48⁰-78.17⁰

M.S.L.: 457-459

Geographical Area: 6,30,766 ha

Agro- climatic Zone : Gird Zone VII

Demography :

No of Block	No. of	No. of village on the basis of population group
Guna	286	301
Bamori	223	250
Aron	164	170
Raghogarh	289	316
Chachoda	298	301
Total	1260	1338

Land use pattern:

Land Use Pattern	Area (ha)	Percentage
Geographical area	6,30,766	100
Forest Area	1,01,375	16.07%
Unutilized Agriculture land	96,282	15.26%
Other fallow land	23,193	3.67%
Cultivable waste land	9,457	1.50%
Fallow and uncultivated land	65,847	10.44%
Net sown area	3,34,612	53.04%
Double cropped area	1,68,362	26.69%
Irrigated area	1,78,045	54.25%
Cropping Intensity	-	150.31%

Socio-economic activities

The major occupations are farming and trading in all types of general goods and agricultural produce. Also livestock farming is appreciably practiced with major livestock such as goat, sheep and poultry.

Sampling Techniques

Five communities towns out of 16 in total were randomly selected for the study. The selected communities were Ten (10) each of soybean products sellers, breast feeding mothers and rural dwellers were randomly selected from each of the 6 communities. This gave a total of 180 respondents that constitute the sample for the research.

Data Collection

Data were generated from both primary and secondary sources. Primary data were collected with the aid of well structured format. The format was designed to capture relevant background information of the respondents, their acceptability and consumption of available soybean products as well as the problems militating against the processing of some of the soybean products. Secondary data were sourced mainly from the review of available literature, both published and unpublished. It consists

of the review of relevant textbooks, journals, magazines and the internet, among other sources.

Data Analysis

Data generated were analyzed using descriptive tools such as percentages, mean, frequency and likert scaling. Frequency and percentage were used to analyze the socio-economic characteristics of the respondents and the problems/constraints in processing and utilization of soybean products in the study area.

Mean and Likert scaling were used to identify the various types of soybean products and those uses;

assess the knowledge base of the people about processing and utilization of soybean products as well as the level of acceptability and consumption of soybean products. Likert scaling was based on a four point rating scale of strongly agree (SA), agree (A), strongly disagree (SD) and disagree (D) with assigned nominal values of 4, 3, 2 and 1 respectively. In determining the cut-off point for decision, any item that received a mean score rating of 3.0 and above was regarded/adjudged as 'agreed' while the item that received a mean score lower than 3.0 was regarded as 'disagreed'.

Total No. of farm holdings in each block: In terms of land holding

Farmers	Aron	Guna	Raghoughar	Chanchouda	Bamori	Total	Percent
Large Farmer (>10ha)	332	790	511	915	412	2960	2.91
Medium Farmer(4- 10 ha)	3059	4818	2229	5525	2715	18346	18.05
Small Farmer (1- 4 ha)	6228	8481	5347	12880	7716	40652	40.01
Marginal farmer (0- 1 ha)	5998	7966	6223	12050	7403	39640	39.01
Total	15617	22055	14310	31370	18246	101598	99.98

Table 1 :Socio-economic characteristics of the respondents

Variable	Frequency	Percentage (%)
Age:		
Below 20	25	13.9
21 - 30	30	16.7
31 - 40	70	38.9
41 – 50	40	22.2
50 and above	15	8.3
Gender:		
Male	84	46.7
Female	96	53.3
Marital Status:		
Married	98	54.4
Single	38	21.1
Divorced	20	11.1
Widow	24	13.4
Family Size:		
0 – 4	45	25
4 – 6	45	25
6 – 8	60	33.3
Above 8	30	16.7

Source: Field Survey, 2015.

RESULTS AND DISCUSSION

Socio-economic characteristics of the respondents

These are with respect to age distribution, gender, marital status, educational level, occupation, family size etc. Results of the findings are presented in the table 1 above. From table 1 above, 38.9% of respondents fell within the age range of 31 – 40 years while 22.2% of them fell within the age group of 41-50. Again 16.7% of the respondents belonged to 21-30 age group and 13.9% of them were below 20 years while the respondents above 50 years constitute 8.3%.

In all, majority of the respondents were the age group of 30-45 years which is regarded as the active productive age, meaning that the population is active. It also implies that processing and use of soybean products are in the hands of this age group which constitute the active population. It further implies that soybean product acceptability and consumption can be further enhanced or encouraged in Guna district. With respect to gender, 46.7% of the respondents are male while 53.3% of the respondents are female. This shows that although females are in the majority, soybean product consumption is not restricted to any gender. It has equally shown that the acceptability of the crop within area is high, indicating that the crop is very popular within Guna district. Survey results showed that 54.4% of the respondents were married and 21.1% of them were single, 11.1% of them were divorced and 13.4% of the respondents were widowed while this shows that both the married, single, divorced, and widows accepted and consumed soybean products in Guna district. Furthermore, the distribution of respondents based on their educational level showed that 8.9% had no formal education while 22.2% had primary education, 16.7% had secondary education uncompleted while 41.1% of them completed their secondary education. Only 11.1% of them attained tertiary education. From the above, a greater number of soybean product consumers, marketers and processors in Guna district. are educated.

Table 2. Mean distribution of the available soybean products for consumption.

S/n	Items	SA	A	D	SD	Mean(X)	Remarks
	Scores:	4	3	2	1		
	Soybean products processed and used in the locality:						
1	Soybean oil	24	36	60	70	2.2	Disagree
2	Soybean meal	63	45	45	27	2.7	Disagree
3	Soybean powdered milk	79	63	20	18	3.0	Agree
4	Soybean flour	78	60	20	22	3.1	Agree
5	Soybean liquid milk (soymilk)	72	81	27	-	3.3	Agree

Source: Field Survey, 2015.

In terms of family size, 25% of them had between 0 – 4 and 4 – 6 children respectively, 33.3% had 6 – 8 children while 16.7% of the respondents had family size above 8 persons. All the respondents had family size of at least 4 persons. This implies that majority of the respondents had moderate family size which could be attributed to high level of enlightenment or exposure.

Available soybean products for consumption in the locality : Above table 2 represents the frequency of responses and the mean distribution or score per item on the available soybean products for consumption. From the table, items number 3, 4 and 5 have the mean scores above the cut-off point 3.0. Items number 1 and 2 have mean score below the cut-off point. This implies that items with mean scores above the cut-off point 3 are readily available in the locality while items with mean scores below the cut-off are fairly or not available in the locality.

The analysis results showed that soybean powdered milk, soybean flour and soybean liquid milk (soymilk) are readily available in Guna district. On the other hand, soybean oil and soybean oil are rarely found or processed in the area.

The knowledge base of the people about processing and utilization of soybean products

Table 3 below represents the frequency of respondents and the mean scores per item on the information on the knowledge base of the people about processing and use of soybean products. Item numbers 3, 4 and 5 have mean scores above the cut-off point of 3.0. Item numbers 1 and 2 have mean score below the cut-off point. Survey results showed that the majority of adult population has been reached mainly with the knowledge and skill in soybean processing and utilization through the mass media, interaction with other people, hospitals and clinics. Extension service delivery on soybean technologies appear to be ineffective since majority of the people did not benefit through this channel. Majority of the respondents got the knowledge on the processing and use of soybean products through interaction with other people, mass media like television, radio, health magazines, cookery books and at the hospitals, maternity and clinics.

Level of acceptability and consumption of soybean products in the locality

Table 4 below represents the frequency of responses and the mean scores per item on the level of acceptability and consumption of soybean products in the study are: From the table, all the items have mean scores above the cut-off point 3.0. This implies that soybean products are widely accepted and consumed in Guna district. Soybean products are widely accepted and consumed by over 50% of adults, 60% of house wives, and over 90% of growing children. Survey results showed that 5.6% of the respondents opined that poor transportation system was a critical problem in the processing and use of soybean products in the area. Furthermore, 27.8% and 16.7% of the respondents respectively noted that inadequate financial resources and lack of market information constituted major challenges. Again, lack of processing facilities and methods (38.9%) and non-availability of improved storage facilities (11.0%) were also found to be problems/constraints associated with the processing and utilization of soybean products in Guna district. Figures in parentheses are percentage respondents table 5 below.

Table 3. Distribution of respondents according to their knowledge base on processing and utilization

S/n	Items	SA	A	D	SD	Mean(X)	Remarks
		Scores:					
			4	3	2	1	
1	Literate adults have been educated on the processing and utilization of soybean products.	60	63	36	21	2.9	Disagree
2	A good number of adults have been educated by the extension workers on the processing and use of soybean products.	54	70	30	26	2.8	Disagree
3	A good number of adults have been educated on processing and use of soybean products.	72	72	27	9	3.2	Agree
4	Expectant and nursing mothers have been educated on the	63	108	9	-	3.3	Agree

	processing and use of soybean products in hospitals, maternity and clinics						
5	A good number of adults have the knowledge about processing and use of soybean products.	80	81	19	-	3.3	Agree

Source: Field Survey, 2015.

The above findings imply that lack of processing methods and facilities, inadequate financial resources and lack of market information could be the major challenges facing the people in the processing and utilization of soybean products in Guna district.

Discussion of Findings

On the completion of the assessment of the level of soybean acceptability and consumption in Guna district, it was discovered that many people in the locality have knowledge on the processing of soybean. The people of the locality have known the ways of processing the available soybean products through their interaction with fellow human beings. Also some have the knowledge of processing techniques through the mass media like television, radio etc. Furthermore, some got the knowledge from the briefings they received from clinics, hospitals and maternities. More so, the result of the study revealed that the people have positive attitude towards the consumption of soybean products and its acceptability because of its high nutritive value which has been made known to the people through various educational media.

According to Morrison (1996) and Jacob (1990), the bean contains about 20% of oil by weight and 40% of protein. They also said that soybean have more protein than beef and more calcium than eggs. Therefore, soybean has been used as food for centuries because of the above exceptional nutritive value and the acceptability and consumption of the soybean products are as a result of the awareness or knowledge of the nutritive value of soybean. Finally, some items of the table showed that some people have not been educated through cookery books and by the extension workers. Also, some soybean products like soybean oil, soybean cake and soybean meal were not yet available in the locality. The reasons for this, according to respondents are lack of proper education on the methods of processing and facilities/equipments used for the processing of these products.

Table 4. Distribution of respondents according to their acceptability and consumption of soybean products

S/n	Items	SA	A	D	SD	Mean(X)	Remarks
		Scores:					
		4	3	2	1		
1	Soybean products like soybean oil, soybean powdered milk have been widely accepted and consumed by over 70% of adults.	80	72	10	18	3.2	Agree
2	Over 90% of growing children accepted and consumed soybean products like soybean powered milk, soymilk, etc, as it is being added to their daily pap and beverages.	90	53	27	10	3.3	Agree
3	About 70% of nursing	80	54	27	19	3.1	Agree

mothers have been educated on the rich protein source of soybean and have accepted soybean products like soymilk, soybean powered milk, etc, for conversion into the perfect baby food-breast milk.

4	About 60% of house wives have accepted and consumed soybean products like soybean flour, soybean oil, hence the paste is added to food such as yam, pap, potatoes, vegetable soups etc.	54	99	18	9	3.1	Agree
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Source: Field Survey, 2015.

Table 5. Distribution of Respondents according to their perception of the Problems/Constraints in Soybean Processing and Utilization

Problems/Constraints	Frequency	Percentage (%)
Poor transportation system	10	5.6
Inadequate financial resources	50	27.8
Lack of market information	30	16.7
Lack of processing facilities and methods	70	38.9
Non-availability of improved storage facilities.	20	11.0

Source: Field Survey, 2015.

CONCLUSIONS

From the results of the research, it can be concluded that: A great number of people have accepted and consumed soybean products because of its high nutritive value which have been made known to the people. Many people have been educated on the processing and use of soybean products in different ways. There are now available soybean products such as soybean powdered milk, soybean liquid milk (soybean milk) and soybean flour. Some soybean products such as soybean oil, soybean cake and soybean meal are not at all available in the locality due to lack of processing methods and 324 Int. Res. J. Agric. Sci. Soil Sci. facilities.

RECOMMENDATIONS

Based on research findings, the following recommendations were made:

1. That food specialist extension workers should be sent to various towns and regions to continue with the education of rural people on how to process other soybean products such as Soybean Milk, soybean oil, soybean cake and soybean meal.
2. That Government should provide rural people with facilities such as processing machines (like grinding mill, manual bridge press, rain press, decorticators and expellers), at subsidized rates in order to encourage them and to enhance processing of these products that are not available in the locality.

3. That markets should be develop for soybean products seller in order to enable the people to take advantage in the commercialization of these processed soybean products thereby bring about rural development.
4. That many articles on soybean products processing and used should be published.
5. Finally, that farmers should be encouraged to cultivate soybean or to engage in soybean production.

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Impact of Nutrition Garden among Farm women in Gird Zone of M.P.

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ABSTRACT

Guna district of M.P. distinct with their geographical position, area, Soil pattern as well as cropping pattern of other state of India but the same problem of Guna district is malnutrition and unavailability of fruit, vegetables in their daily diet. Common nutritional problems of human beings are protein energy malnutrition , micro nutrient like vitamin A, Iron anaemia, Iodine and Vitamin B complex. To tackle these problems recommendations are:

- (1) Eat variety of foods to ensure balanced diet like grain flour, pulses, Fruit and vegetables .
- (2) Eat protective foods rich in vitamins and minerals.
- (3) Eat folate rich foods for haemoglobin synthesis like green leafy & rooted vegetable.
- (4) Eat plenty of fruits and vegetables which are rich sources of micro and macronutrients.

Krishi Vigyan Kendra, Aron works on for availability of maximum Nutritional content in their daily diet since year 2012 through promoting backyard kitchen garden under layout. KVK Scientist promote Farmers and Farm women to prepare and safe minimum 200 sqft land for backyard kitchen garden with layout and grow at least 5 Fruit plant (Guava, Papaya, Lemon, Pomegranate, Jackfruit) , Five seasonal Vegetable (Green vegetable, Sehjan, Tomto, Bottle guard, Bittergurd) and medicinal & Spice plants (like Tulsi, Ginger, Turmeric). This vital effort is achieved by the KVK by seeing the interest of Farmers and farm women in use the layout for Kitchen Garden. The number of farm family increased year after year to use layout for backyard kitchen garden to provide balanced diet of their family to overcome the malnutrition and other problem. By the Feed back received from the farmers, they not only cover the nutritional content in their diet but also save Rs 100 to 150 additional expenditure to purchase fruit and vegetables.

The main objective of this successful and vital effort to promote backyard kitchen garden under layout of minimum 200 sqft to use by the every household and farming community to live healthy and remains healthiness. India has a rich heritage of home-grown fruits and vegetables. They are not only rich in minerals and vitamins but also, contribute in a big way in maintaining health, overcoming hunger and malnutrition. Among the rural community, their consumption is very low due to lack of purchasing power, ignorance and other factors including unavailability. Cultivation of these crops by gardening in a systematic manner in small pieces of land available in households is known as "Nutrition Garden". The nutrition garden ensures access to healthy diet with adequate macro and micronutrients at doorstep.

INTRODUCTION

The expert committee of Indian Council of Medical Research (ICMR) recommends that every individual should consume at least 300 g vegetables and 100 g fresh fruits /day (green leaf vegetables – 50 g, other vegetables 200 g, roots and tubers -50 g). Pregnant women should consume 100 g leaf vegetables/day.

A world vegetable survey showed that 402 vegetable crops are cultivated worldwide, representing 69 families and 230 genera (Kays and Dias ,1995; Kays,2011). Leafy vegetables - of which the leaves or young leafy shoots are consumed-were the most often utilized(53% of the total), followed by fruit vegetables(15%), while vegetables with

belowground edible organs comprised 17%. Many vegetable crops have more than one part used (Dias and Ortiz, 2014).

Vegetables are grown on large and small farms, on good and marginal lands, in urban and rural areas and by large commercial growers and small subsistence farmers, as well as in home gardens. Short production cycle of vegetables allow multiple cropping and a significant volume of vegetables grown worldwide are produced in small plots. According to FAO statistics, the production of vegetables in the world in 2009 was almost 1010 million tons (FAO, 2011). Asia produces and consumes more than 70% of the world's vegetables. China has always been a large contributor and currently produces over 50% of the world's vegetables. India is the second largest producer of vegetables in the world but at almost a six-fold lower level than China. Worldwide the area of arable land devoted to vegetables is expanding at 2.8% annually, higher than fruits (1.75%), oil crops (1.47%), root crops (0.44%) and pulses (0.39%) and at the expense of cereals (-0.45%) and fiber crops (-1.82%) (FAO, 2009).

Home gardens once used to be a cornerstone of traditional Indian farming systems, but over the time, they have slowly begun to lose their importance in people's eyes as a relic of old-fashioned customs. But

now, their importance is being recognized once again. Home gardens can be taken on many forms, from a few plants in containers to large garden plots in the backyard. Beyond the reward of homegrown produce, gardens provide an easy access to fresh and nutritious vegetables, besides the health, environmental and enjoyment advantages for the gardener. The benefits of a home garden make the physical exertion and costs of gardening worth the effort.

IMPORTANCE OF VEGETABLES IN HUMAN HEALTH AND NUTRITION

Vegetables are rich sources of nutritional bioactive compounds. They are important sources of protective nutrients like vitamins, minerals, antioxidants, folic acid and dietary fibres. The diversified and highly nutritive vegetables are affordable and cost effective solution to hidden hunger and malnutrition. A person on average needs a daily diet which should provide 2800 calories, 55 g protein, 450 mg Ca, 20 mg Fe, 3000 mg β -carotene, 50 mg vitamin C, 100 mg folic acid, 1.0 mg vitamin B, 1.4 mg thiamine, 1.5 mg riboflavin, 19 mg niacin and 5 mg vitamin D. Vegetables are good source of all these nutrients (tables 1&2) (Sharma, 2009).

Table 1. Basic food requirement of a Five-member family. (According to NIN, Hyderabad.)

Particulars	Per head per day requirement (gm.)	Food requirement/ Annum (kg)	Family requirement + 5% surplus for family guest
Cereals	425	930.75	977.29
Rice	200	438	459.90
Wheat	225	492.75	517.39
Pulses	70	153.3	160.97
Oils	35	76.65	80.48
Vegetables	285	624.15	655.36
Leafy	100	219	229.95
Tubers and roots	85	186.15	195.46
Other vegetables	100	219	229.95
Milk	214	468.66	492.09
Fruits	140	306.6	321.93

Table 2. Nutritional composition of vegetables per 100 g edible portion

Vegetable crops	Energy (Kcal)	Moisture (g)	Protein (g)	Fat (g)	Carbo hydrates (g)	Fibre (g)
Amaranth	45.0	85.7	4.0	0.5	6.1	1.0
Asparagus	26.0	91.7	2.5	0.2	5.0	0.7
Bittergourd	25.0	92.4	1.6	0.2	4.2	1.7
Bottle gourd	12.0	96.1	0.2	0.1	2.5	1.5
Brinjal	24.0	92.7	1.4	0.3	4.0	-
Broad bean	48.0	85.4	4.5	0.1	7.3	-
Broccoli	37.0	89.9	3.3	0.2	5.5	2.6
Brussel's sprout	45.0	85.2	4.9	0.4	8.3	1.5
Bengal gram leaves	97.0	73.4	7.0	1.4	14.1	-
Cabbage	24.0	92.4	1.3	0.2	5.4	1.5
Capsicum	29.0	92.5	1.2	0.2	4.0	2.5
Chilli	29.0	82.6	2.9	0.6	6.1	6.7
Carrot	42.0	88.6	1.1	0.2	9.1	1.0
Coriander leaves	44.0	66.3	3.3	0.6	6.3	-
Cauliflower	27.0	91.0	2.7	0.2	5.2	0.9
Cucumber	18.0	96.3	0.4	0.1	2.5	0.6
Drumstick leaves	92.0	76.0	6.7	1.7	12.7	0.9
Fenugreek leaves	49.0	86.1	4.4	0.9	6.0	1.1
French bean	30.0	62.0	6.3	0.1	29.8	4.0
Garlic	32.0	90.1	1.9	0.2	7.1	0.8
Mint	48.0	84.9	4.8	0.6	5.8	2.0
Musk melon	17.0	95.2	0.3	0.2	3.5	0.6
Okra	35.0	89.6	1.9	0.2	6.4	1.2
Onion	50.0	86.6	1.2	0.1	11.1	0.5
Pea	84.0	78.0	6.3	0.4	14.4	4.0
Potato	97.0	74.7	1.6	0.1	22.6	1.6
Pumpkin	25.0	92.6	1.4	0.1	4.6	0.5
Radish	17.0	94.4	0.7	0.1	3.4	0.7
Sponge gourd	18.0	93.2	1.2	0.2	2.9	0.5
Spinach	26.0	90.7	3.2	0.3	4.3	-
Sweet potato	124.0	68.5	1.8	0.7	28.0	1.0
Tomato	22.0	93.5	1.1	0.2	4.7	0.7
Watermelon	26.0	92.6	0.5	0.2	6.4	0.2
Taro corm (Arvi)	97.0	73.1	3.0	0.1	22.1	-
Giant Taro (Kachloo)	71.0	81.2	0.6	0.1	17.0	-
Cowpea leaves	51.0	84.6	4.3	0.2	8.0	-

Table 3. Vitamin composition of vegetables per 100 g edible portion

Crops	Vitamin A (IU)	Thiamin (mg)	Riboflavin (mg)	Niacin (mg)	Vitamin C (mg)
Amaranth	9,108	0.03	0.30	1.2	99.9
Asparagus	900	0.18	0.20	1.5	33.0
Bittergourd	208	0.07	0.09	0.5	88.0
Bottle gourd	traces	0.03	0.01	0.2	6.0
Brinjal	122	0.04	0.11	0.9	12.0
Broad bean	15	0.08	-	0.8	12.0
Cabbage	130	0.05	0.05	0.03	47
Capsicum	900	0.06	0.06	0.5	175
Chilli (green)	454	0.06	0.03	0.6	111
Carrot	11,000	0.06	0.05	0.6	8
Coriander leaves	11,168	0.50	0.06	-	135
Cassava	700	0.05	0.10	0.3	25
Cauliflower	60	0.11	0.10	0.7	78
Cucumber	0.00	0.03	0.0	0.2	7
Drumstick leaves	11,187	0.06	0.05	0.8	220
Fenugreek leaves	3,861	0.04	0.31	0.8	52
French bean	10	0.06	0.23	0.4	13
Garlic	600	0.08	0.11	0.5	19
Mint	2,700	0.05	0.20	0.4	750
Musk melon	279	0.11	0.08	0.3	26
Okra	172	0.07	0.10	0.6	13
Onion	35	0.08	0.01	0.4	11
Pea	640	0.35	0.14	2.4	27
Potato	32	0.10	0.01	1.2	17
Pumpkin	2180	0.06	0.04	0.05	2
Radish	5	0.06	0.04	0.05	15
Spinach	8100	0.10	0.20	0.6	51
Sweet potato	8800	0.10	0.06	0.6	21
Tomato	900	0.06	0.04	0.7	23
Giant Taro (Kachloo)	-	0.31	0.57	5.4	180
Cowpea pods	941	0.07	0.09	0.9	13
Yam	-	0.1	0.01	0.8	15

DIETARY FIBRE

Dietary fibres are mainly plant cell walls containing cellulose, pectins, xyloglucans, xylans, mannans, and free arabinans. There are both soluble (plant gums, pectins and mucilaginous materials) and insoluble fibres (lignin, cellulose and part of hemicellulose). Fibres have high water binding capacity and produce viscosity. They possess cholestrolemic effect, bind bile acids and promote faecal excretion. They delay absorption of glucose and fats after meal, increase faecal bulk and speed up the passage through digestive tract, thus preventing the risk of constipation, haemorrhoids, colon cancer and diverticulosis.

PROTEINS

Vegetables are quite low in protein content when compared to dry pulses. Protein rich vegetables are peas, lima bean, drumstick leaves, french bean and celery. Potato, cauliflower, okra, cowpea, beat leaf(palak),fenugreek(methi) leaves and onion are also sources of protein.

VEGETABLES AND ANTIOXIDANTS

There are numerous compounds in vegetables which function as antioxidants. Primary among them are α -carotene, vitamin 'C', vitamin 'E', selenium and flavonoids. There is evidence that antioxidants like carotene, ascorbic acid (vitamin C), β -tocopherols (vitamin E), flavonoids and selenium are significantly associated with reduced cancer risks (Singh, 2012). Vegetables are rich sources of antioxidant nutrients viz., vitamin C, vitamin E and the carotenoids. Certain flavonoids like quercetin, kaempferol, myricetin and luteolin are also present in vegetables.

CAROTENOIDS

They are the pigments in fruits and vegetables which protect from damage to lipids, blood and other fluids. Among 600 and more naturally occurring carotenoids, majority have antioxidant properties (Table 3). Beta carotene is present in dark green leaf vegetables, carrot and pumpkin . It provides protection from coronary heart diseases and lung cancer. Lycopene is a carotenoid present in tomato and watermelon which prevents oxidation of LDL cholesterol and reduces damages to arteries. It will also reduce the risk of bladder cancer and pancreatic cancer.

Table 4. Qualitative and quantitative carotenoid distribution in vegetables

Vegetables- carotenoids (mg/g fresh wt)	Total	β -carotene	Major carotenoids
Asparagus (<i>Asparagus officinalis</i> L.)	8.5	4.3-7.0	α -carotene. Lutein, Violaxanthin, Neoxanthin
Bitter gourd (<i>Momordica charantia</i> L.)	5.3	2.3	α -carotene, β -carotene. Zeinoxanthin. Lutein
French bean (<i>Phaseolus vulgaris</i> L.)	17.1	2-4	α -carotene, β -carotene. Lutein 5,6- epoxide. Neoxanthin, Violaxanthin
Broccoli (<i>Brassica oleracea</i> var. <i>italica</i> Plenck.)	42.4	4.8	α -carotene. Lutein, Isolutein, Luteoxanthin, Violaxanthin, Neoxanthin, Chrysanthemaxanthin
Cabbage (<i>Brassica oleracea</i> var. <i>capitata</i> L.)	8.9	0.8	β -carotene. Lutein, α -carotene 5,6- epoxide, Neoxanthin, Violaxanthin, Chrysanthemaxanthin
Carrots (<i>Daucus carota</i> L.)	54-124	76.0	β -carotene, β -carotene, J-carotene, α -Zeaxanthin, r-carotene, Neurosporene
Cauliflower (<i>Brassica oleracea</i> var. <i>capitata</i> L.)	0.44	0.11	β -carotene, Lutein, Violaxanthin, Neoxanthin
Cucumber (<i>Cucumis sativus</i> L.)	17.2	2.20	α -carotene, β -carotene and Cryptoxanthin
Pepper (Green) (<i>Capsicum annuum</i> L.)	10.0	6.8	Capsanthin, Capsorubin, Cryptocapsin, β -carotene
Pepper (Red)	127-284	1.27-2.84	β -carotene, Violaxanthin, Neoxanthin
Lettuce (<i>Lactuca sativa</i> L.)	68.0	10.8-24.5	β -carotene, Lutein, Violaxanthin, Neoxanthin
Spinach (<i>Spinacia oleracea</i> L.)	69.0	40.0	β -carotene. Lutein epoxide, Violaxanthin, Lutein, Antheraxanthin, Neoxanthin
Tomato (<i>Lycopersicon esculentum</i> L.)	70-190	7.8	Lycopene, α -carotene, Phytoene.

Source: Pigments in vegetables: Chlorophylls and Carotenoids, Jeana Gross (1991). Van Nostrand Reinhold, New York

ASCORBIC ACID

Ascorbic acid or vitamin C is a water soluble antioxidant which is easily oxidized to form semi-dehydro ascorbic acid that is relatively stable. Being an electron donor, ascorbic acid serves as a reducing agent for many reactive oxidant species. It reduces tocopherol radicals to their active form. Ascorbic acid is seen abundantly in

green leaf vegetables like drumstick leaves, coriander leaves, turnip green, sweet pepper, chilli, Brussels sprouts, broccoli and cabbage. Bittergourd, cauliflower, amaranth and beet leaf are also good sources of vitamin C.

VITAMIN E

It is the major lipid soluble antioxidant responsible for protecting the polyunsaturated fatty acids in membranes against lipid peroxidation by free radicals and singlet oxygen species. Cruciferous vegetables have high level of antioxidants viz. carotenoid, tocopherol and ascorbate. Kale has the higher level followed by broccoli and Bussels sprouts.

FLAVONOIDS

They are one of the most widely occurring groups of secondary metabolites or phytochemicals in plants. They induct enzymes which detoxify carcinogens. The flavonoids are a large family of lower molecular weight polyphenolic compounds found in plant tissues, which include the flavones, flavonols, flavonones, anthocyanin anthocyanidins, catechins and isoflavonoids. Other phenolics like p-coumaric, caffeic, ferrulic and chlorogenic acids are reported in tomato. They are mostly present in the skin. Among cucurbits, flavonoids are present in genera *Cucumis*, *Lagenaria*, *Citrullus* and *Luffa*. Quercetin and kaemferol are reported in french bean (Singh, 2012). Cheratin is a flavonoid isolated from bitter gourd having hypoglycaemic effect. Onion and garlic contain several sulphur containing compounds like allicin, garlicin etc. which reduce blood cholesterol and help to prevent coronary heart diseases and heart attacks.

FOLATES

Folates or folic acids are found in abundance in spinach followed by other green leaf vegetables and beans. It is one among the two vitamins associated with magaloblastic anaemia often seen in children and pregnant women. Diets high in folic acid reduce the risk of colon cancer and cardio vascular diseases. The actual requirement of folic acid ranges from 50-100 µg but for pregnant women the recommendation is 150-300 µg/day.

NATURAL PIGMENTS

This group includes anthocyanin, betalains, carotenoids, chlorophylls etc. They are exploited as the source of neutraceuticals used against many human ailments. These pigments are useful to maintain human health, to protect from chronic diseases or to restore wellness by repairing tissues.

Anthocyanin pigment gives purple colour to brinjal, amaranth, cowpea, dolichos bean etc. It is an important and widely distributed group of water soluble natural pigments which can prevent cardio vascular diseases, neurological diseases and cancer. But the amount of anthocyanin being negligible in vegetables, transgenic tomatoes, with purple colour were developed in U.S.A. by transferring genes from snapdragon flowers. Similarly purple cauliflowers, purple capsicums etc. are also catching the market.

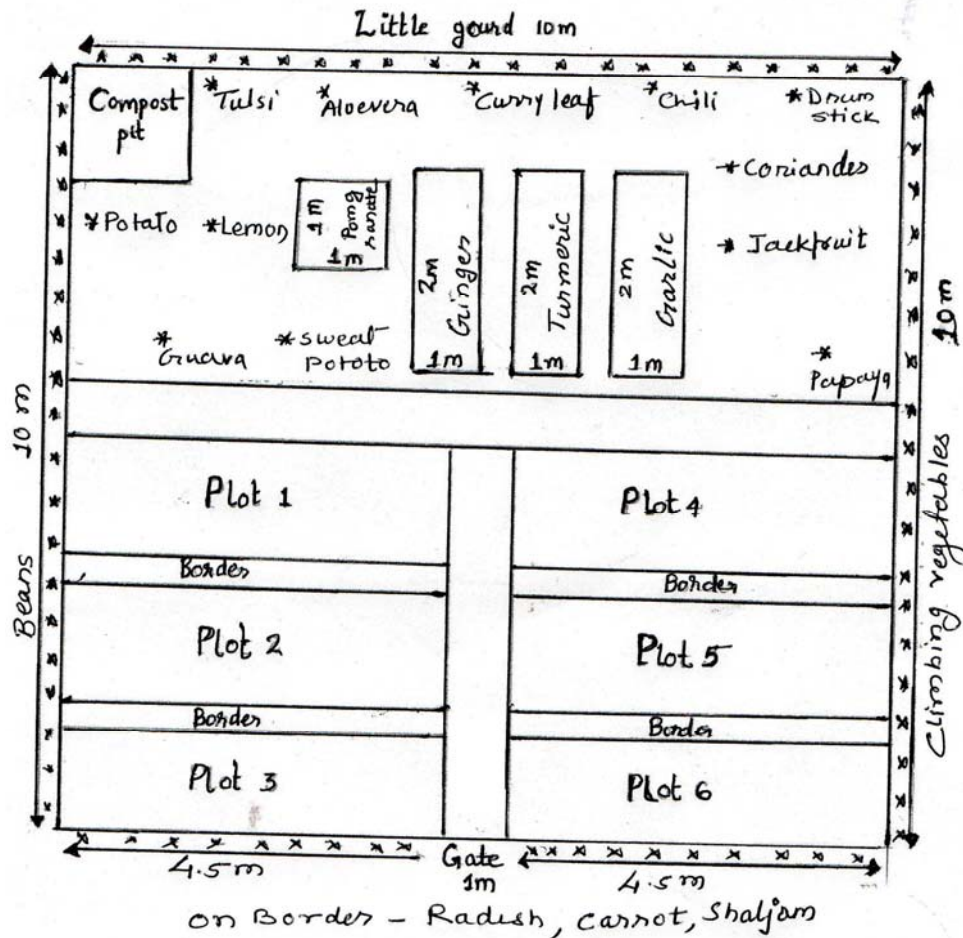
ADVANTAGES OF NUTRITION GARDENING

1. Nutrition gardening is the best means of recreation and exercise.
2. Helps in lowering down the family budget for vegetable .
3. Ideal medium for training children through gardens, in beauty and order.
4. Secures enough vegetables within the means of all classes at very cheap rate.
5. The cost of raising vegetables utilizing family labour is affordable and it gives a special appeal to palate.
6. Provides fresh vegetables free from infection from unsanitary markets.

DESIGN AND LAYOUT OF A NUTRITION GARDEN

A model nutrition garden sustains fruits and vegetables either separately or in combination. An area of 20 m² (1/2 cent) is sufficient to provide required quantity of fruits and vegetables to one adult. A nutrition garden with an area of 100 m² will be sufficient for a family of 5 members (Fig.1).

Layout of a nutrition garden (100m²)



LOCATION

Select an open area receiving plenty of sunshine. As far as possible it should be near the house and well protected from stray cattle. It should be near a source of irrigation. The garden should be located on the eastern or southern side of the house to have maximum sunlight.

PLAN OR LAYOUT

The main objective in layout is the most economic utilization of space. Cropping intensity should be maximum in a nutrition garden. Fences, borders and interspaces of perennial crops are utilized for vegetable cultivation. A rectangular garden is preferable than a square garden.

Planning is very essential for the successful management of a nutrition garden. The plan will vary in size and shape according to the availability of space, interest of family members, soil, climate, selection of vegetables etc. It is always better to have a small, well kept garden than a poorly managed large one.

COMPONENTS OF A NUTRITION GARDEN

1. PERENNIAL CROPS

Perennial fruits and vegetables are located at one end of the garden so that they will not interfere with the intercultural operations of other crops and will not shade them. Usually grafts or dwarf varieties of fruit plants are preferred in a nutrition garden as they occupy only lesser space.

2. ANNUAL PLOTS

After the allotment of land for perennial crops, the remaining area may be divided into equal plots for raising annual vegetables. For continuous and steady availability of vegetables round the year, crop rotation has to be followed in each plot, which will reduce the pest and disease incidence also.

3. BORDERS

On the borders of garden plots dwarf and bushy vegetables are grown.

4. FENCES

Fence can be made up of barbed wire to protect the crop from stray animals. Live fence is made up of plants like chekkurmanis or other trailing vegetables like coccinea, winged bean and dolichos bean.

SELECTION OF CROPS

Select locally adaptable crops and varieties as far as possible. Preference should be given for raising pest and disease resistant varieties. F_1 hybrid vegetables give early and high yield. Seeds or planting materials should be collected from reliable source like State Agricultural Universities, State department of Agriculture/Horticulture, National seeds corporation and registered seed companies.

FRUITS IN A NUTRITION GARDEN

Layers, grafts and cuttings of fruit plants are used as planting materials. Dwarf varieties of banana or culinary banana are usually grown in a nutrition garden. Guava, pineapple, papaya, carambola, west Indian cherry etc. are some other fruit plants grown in a nutrition garden. The interspaces of these crops are utilized for growing ginger, turmeric, amorphophallus etc. Ratooning is practiced in banana and pineapple.

After harvest of bunches, one or two suckers are retained and the ratoon crop raised from them.

CULTIVATION PRACTICES

Nursery raising, land preparation, manure application, sowing/planting, fertilizer application, irrigation, earthing up, weeding etc. are the major operations in vegetables.

NURSERY RAISING

Solanaceous vegetables and cole crops like cabbage and cauliflower are usually transplanted to the main field. Seeds of these vegetables are sown in open nursery beds or in plug trays. Since the open field nursery beds are facing various problems, vegetable seedlings are mostly raised in hi-tech nurseries in plugtrays. Plug trays of various size are available in the market with reasonable cost. They are filled with coconut pith or potting mixture. F_1 hybrid seeds being very costly, only one seed/pit is sown in these trays. Tray sowing ensures 100% seed germination when compared to nursery beds in open field. After 20-25 days, vigorous seedlings are ready for transplanting. Care should be taken to irrigate the nursery every day, but there should not be waterlogging. Damping off is a serious disease in the nursery which can be controlled by seed treatment with captan @3g/kg of seed. The seedlings are to be hardened 3-4 days before planting by withholding irrigation and it will reduce the transplanting shock.

LAND PREPARATION

The land should be prepared thoroughly by proper digging or ploughing. Planting can be done in flat beds, ridges, furrows, pits and mounts, according to location and season. Burning of dry leaves or stubbles in pits or furrows is a good practice which will eliminate soil borne pests and improve soil fertility.

MANURES AND FERTILIZERS

Organically grown vegetables are catching the market now-a-days. People are more health conscious and they are forced to grow as much vegetables in their home garden as possible. Most of the vegetables purchased from markets are contaminated with plant protection chemicals. Hence organically grown vegetables and fruits are preferred especially when they are consumed in raw form. Farm yard manure, poultry manure, goat

manure, wood ash, vermicompost, neem cake etc. are a few organic manures used in vegetables. A compost pit at one corner of nutrition garden helps to dump crop residues and other wastes of a kitchen garden which can be converted into good organic manure. Organic manures are applied @ 100 kg/40 m² at the time of land preparation. In organic farming, vermicompost or other manures are top dressed at two or three stages.

IRRIGATION

Irrigate the crop daily during summer. But it should not be excess. Waste water can be used for irrigation, which is free of any toxic chemicals or detergents. Irrigation interval can be reduced by mulching the plant basins with dried leaves, straw or polythene mulches. Mulching will not only conserve moisture but also check weed growth.

INTERCULTURAL OPERATIONS

Weeding and earthing up are the intercultural operations in vegetables. Weeding is done before fertilizer application which ensures more nutrient absorption. Earthing up is done along with fertilizer application. Shallow intercultural operations like hoeing is done to improve the soil aeration. For trailing vegetables, iron frames or permanent pandals are to be erected. Though their initial cost is high, they can be used for a longer period

PLANT PROTECTION

Pests and diseases are the major constraints in vegetable production. Systematic and timely control measures are necessary to protect the crop from the pathogen. Emphasis should be given to follow biological, cultural and mechanical method for controlling pest and diseases. As far as possible use home made formulations which is free from phytotoxicity

HARVEST AND POST HARVEST HANDLING

Vegetables and fruits are to be harvested at their optimum stage of maturity for better quality and yield. Harvesting should preferably be done at cooler part of the day and while harvesting care should be taken to avoid mechanical injury to the plant. After harvest direct contact with sunlight, heat or rain should be avoided. Avoid damage or bruise to

vegetables, wash root crops in running water and do not heap fruits and vegetables after harvest.

Vegetables are consumed either raw and fresh or in cooked form. Excess vegetables are processed as sauce, squashes, pickles or chips. While cooking care should be taken to minimize the loss of nutrients and some tips are given below.

1. Vegetables are to be used immediately after harvest otherwise their water and vitamins will be lost.
2. Wash vegetables under running water before cutting or peeling to remove dirt, dust, insects, etc. Soak vegetables like cauliflower in salt water to reduce the pest load. Do not wash vegetables after peeling, cutting or slicing, since this would result in the loss of water soluble nutrients.
3. Trimming of vegetables should be reduced or avoided whenever possible.
4. Peeling is done as thin as possible since many nutrients are found just below the skin.
5. Do not cut vegetables into too large or too small pieces. Cut vegetables are cooked immediately.
6. Vegetables are to be cooked for as short time as possible. Boil water first and then add vegetables.
7. Never use excess water to cook. Steaming is better to conserve nutrients than boiling.
8. Pressure cooking is desirable as it reduces cooking time and conserve nutrients.
9. Don't overcook vegetables, never use soda while cooking since it destroys vitamins.
10. Avoid frying of vegetables as it destroys vitamin. Use prepared dishes immediately and avoid reheating the dishes.

CONCLUSION

Though India is the second largest producer of fruits and vegetables, their consumption is meagre

especially among the rural population. Now-a-days people are more health conscious and good food shall be our medicine. Increased consumption of fruits and vegetables is one of the easiest and cheapest ways of enhancing health. Many underutilized fruits and vegetables, which are rich sources of phytochemicals are to be cultivated in backyard nutrition gardens. There is an increasing demand for indigenous, location specific underutilized vegetables and fruits throughout the world. Backyard nutrition gardening is a low cost sustainable approach for mitigating malnutrition especially in rural households. Home gardening contributes to household food security by providing direct access to food that can be harvested, prepared and fed to family members, often on a daily basis. Even very poor, landless or near landless people can also practice gardening on small patches of homestead land, vacant lots or in containers. Gardening may be done with virtually no economic resources, using locally available planting materials, green manures, "live" fencing and indigenous methods of pest control. Thus, home gardening is a production system that fits well in family farming system.

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SOYBEAN AS A SOURCE FOR NUTRITIONAL SECURITY

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ABSTRACT

The start of commercial exploitation of soybean in India is nearly four decades old. In this period, the crop has shown unparalleled growth in area and production. Soybean has established itself as a major rainy season crop in the rainfed agro-ecosystem of central India. Introduction of soybean has resulted in an enhancement in the cropping intensity and resultant increase in the profitability per unit land area. In India, soybean will continue to remain a major rainfed oilseed crop. A number of varieties that have been bred have resulted in this unprecedented growth. The simulation studies under demonstration and on-farm trials indicate that with current varieties, the rainfed potential of soybean in India is about 2.1 t/ha against the national average productivity of just 1.2 t/ha. Hence, large yield gaps exist between the potential and the actual yields harvested by the farmers. Narrowing of this yield gap may lead to doubling of soybean production. Ridge & furrow and BBF sowing method with 45cm row spacing is being effective for getting higher yield with low cost of cultivation, which is adopted by the farmers. Further improvements in the yield of soybean grain and quality of soybean oil are possible by use of new research methodologies and by exploitation of recent advances in biology. In perspective of value addition in soybean, there is a large potential due the property of its grain. . It is a versatile grain legume because it has a variety of uses. Soybean is rich in protein, vegetable oil and essential minerals. Its value added product like flour uses, Daal, Badi, Chunks, Papad, Milk and Milk product has been introduced among farmers and farm women. Now, most of farmfamilies are aware about its importance and use this awareness for commercial purpose to earn extra income for her family to improve their livelihood security. Ultimately, use of information, will assist small holder farmers to boost soybean production and productivity.

INTRODUCTION

Soybean is one of the most important crops in Guna district. It is a versatile grain legume because it has a variety of uses. Soybean is rich in protein, vegetable oil and essential minerals. This crop has the ability to fix atmospheric nitrogen and therefore, improves soil fertility. Soybean is increasingly becoming popular and serving as an alternative food and cash crop. The area under soybean production as well as productivity are increasing in Malawi due to government policies on value addition, domestic use and crop diversification. Consequently, there is a significant expansion of the soybean industry within Malawi and with substantial demand for export market. Despite its importance and potential, the crop faces a number of major challenges which include short shelf life, poor crop production practices, diseases particularly soybean rust and

effects of climate change. However, the Department of Agricultural Research Services (DARS) through the soybean improvement program in collaboration with its partners such as International Institute of Tropical Agriculture (IITA) has responded and continue to search for sustainable solutions to these challenges by developing suitable soybean varieties adaptable in most agro ecologies in Malawi and has developed appropriate agronomic messages to address and manage some of the challenges. This manual contains valuable information on suitable agro ecologies for soybean production, recommended varieties, seed sources, soybean agronomical practices (land preparation, planting aspects, weeding crop protection), seed production and post harvest handling in Malawi. The appendix contains extra information on nutritional content of soybean

varieties listed in the catalogue of released varieties in Malawi including their botanical classifications. This manual is to be used as reference material and as an essential source of information for farmers, field officers, and researchers in soybean production. Ultimately, use of information from this guide, will assist small holder farmers to boost soybean production and productivity in Malawi. DARS in collaboration with IITA and with financial support from Feed the Future-Integrating Nutrition in Value Chains project developed this guide and its publication is timely because it will help a wide spectrum of stakeholders.

Objectives of the Study

The primary objective of this research is to assess the level of soybean products acceptability and consumption in Orumba South Local Government Area. The specific objectives are to:

1. describe the socio-economic characteristics of soybean farmers/producers and marketers in Guna district
2. Identify and describe the various types of soybean products and their uses in the study area.
3. assess the knowledge base of the people in the locality about processing and utilization of soybean products in Guna
4. determine the level of acceptability and consumption of soybean products in the area.
5. identify the problems/constraints in processing and use of soybean products in Guna.
6. Make recommendations based on the findings of the study

Production and nutritional value of soybean

The soybean (*Glycine max*) is grown as a commercial crop in over 35 countries as the major oilseed (Smith & Huyser, 1987). The fruit of soybean is simple or take the shape of crescent pod, length about 3-7cm, including 1 or 2 seeds which mass of 1000 seeds take out 115-280g. On the fodder designed the seeds in mass about 180-200g. Unripe seeds are green, and mature have from light-yellow by green to brown colour. In practice are used seeds of different cultivars, what influence on colour and form of seeds. The soybean seeds of modern cultivars have spherical shape, and the yellow and green colour is the most desirable (Sikorski, 2007). The soybean

products are use in food industry on whole world. The soybean seeds contain high quantity of protein and its amino acid composition is approximate to composition of animal proteins, therefore is often used as replacement component of meat protein. Soybean seeds are used in oil industry. About 90% of soybean seeds make up cotyledons and 8% there are hulls. In the cotyledons are accumulated proteins and fats, the main components of seeds. In the cotyledons also are accumulated carbohydrates and anti-nutritional factors. In result of separation of this components or their extraction were obtained different soybean products used in people and animals feeding.

Constraints to Soybean Production

Despite having made rapid stride for both coverage and total production, soybean still suffers on productivity front. There are a number of constraints, pertaining to climate, edaphic, production, and technology aspects as mentioned below that hinder higher productivity.

- Most of the area under soybean cultivation are a *rainfed*.
- Erratic behavior of *monsoon* affecting planting.
- Large spatial and temporal variability in rainfall.
- Soil moisture stress at critical growth stages, especially seed-filling stage.
- High-temperature stress at critical growth stages.
- Biotic interferences to crop growth.
- Limited mechanization.
- Poor adoption of improved production technology—low risk covering ability.
- Monocropping and poor varietal diversification increasing risk chances.
- Timely availability of quality inputs.
- Poor/inadequate technological information.
- Poor utilization in food chain owing to characteristics beany flavor of soybean.
- Road blocks in utilization as pulses because of hard-to-cook characteristics of soybean.
- Psychological stigmas and conventional food habits.

- Lack of awareness about health/nutritional benefits.
- Presence of anti-nutritional factors in soybean.
- Limited entrepreneurship for processing.

Soybean Genetic Improvement

To ease the availability of edible oil and pulses, the Government of India has been consistently making efforts to gear up research and development programs through TMO (1986) and TMOPM (1991) and 2004 onward through ISOPOM programs. The ICAR started the All India Coordinated Research Project on Soybean (AICRPS) in 1967. Eventually, ICAR established the National Research Centre for Soybean (now upgraded to Directorate of Soybean Research during XIth Plan) at Indore in Central India in 1987 when soybean covered only about 1.5 million hectares, nearly one-sixth of the present coverage by the crop. At present, soybean has surpassed groundnut and rapeseed/mustard in cultivable area and production, the two most important edible oilseeds among nine oilseeds grown in the country.

The soybean research in India is being pursued by Directorate of Soybean Research (DSR) and All India Coordinated Research Project on Soybean (AICRPS). The AICRPS is an integral part of the DSR with 8 main, 14 sub, and 16 voluntary centers, spread across the nation. The system is well equipped with human resource equipments and infrastructure to conduct quality research. Through their unified efforts and with support from soybean industry, nongovernmental organizations, and farmers, soybean is playing a pivotal role in oil economy of the country. The advancement in research component culminating to improved varieties and agro-ecological zone-specific production technologies and crop protection modules has been the driving force in motivating the other components of production system to function in harmony leading to unparallel growth of the crop and elevated socioeconomic status of small and marginal farmers.

Soybean Genetic Resources

Directorate of Soybean Research is a National Active Germplasm Site (NAGS) for Soybean. It is also

the national repository of soybean varieties and germplasm. The genetic resources of soybean have been extensively augmented, evaluated, and documented since the start of the project, and the total collection now stands at 4,248 accessions of cultivated soybean, 36 accessions of wild relative belonging to GP-3 and annual wild progenitor of cultigen of *Glycine soja*. The genetic resources of soybean have been extensively augmented, evaluated, and documented, and a core collection comprising of 51 accessions have been developed. A number of elite genetic sources possessing specific traits have been identified for further utilization through breeding programs (Table 2).

Processing of Soybean Products

Soybean can be processed into different products such as soybean oil, soybean meal/cake, soymilk, soybean fortified 'gari' and tapioca, soy- ebiripo, soy-tortilla and cereal-based traditional weaning food etc. Variations in processing methods also yield a host of co-product. Soybean processing involves series of steps to produce commodities for food, industrial and animal feed uses. These include: (i) threshing (ii) transport from fields to the threshing or drying sites and to store houses or to collection centres and finally to processing industries where they are processed into different products. (iii) drying (iv) cleaning or elimination of impurities and debris from the harvested crops, (v) packaging (vi) storage (vii) final processing into other products (Dugje I.Y et al., 2009).

Value added product:

The non-fermented soybean products include soymilk, tofu, yuba, soybean sprouts, okara, roasted soybeans, soynuts and soy flour, immature soybeans, cooked whole soybeans, and the fermented oriental soybean products include soy paste (Jiang and Miso), soy sauce, Tempeh, Natto, soy nuggets (Douchi), sufu.

Soybeans: Nutrition Facts and Health Effects

Soybeans or soya beans (*Glycine max*) are a type of [legume](#), native to eastern Asia. They are an important component of Asian diets and have been consumed for thousands of years. Today, they are mainly grown in Asia, and South and North America. In Asia, soybeans are often eaten whole, but in Western countries heavily processed soy products are much more common.

Various soy products are available, including soy flour, soy protein, tofu, soy milk, soy sauce, and soybean oil. Soybeans contain antioxidants and phytonutrients that have been linked with various health benefits, while concerns have also been raised about adverse effects.

Nutrition Facts

Aside from water, soybeans are mainly composed of protein, but they also contain good amounts of carbs and fat.

The table below contains information on all the basic nutrients in soybeans.

Nutrition Facts: Soybeans, cooked, boiled - 100 grams

Content	Amount
Calories	173
Water	63%
Protien	16.6g
Carbs	9.9g
Sugar	3g
Fiber	6g
Fat	9 g
Saturated	1.3g
Monounsaturated	1.98g
Polyunsaturated	5.06g
Omega-3	0.6g
Omega-6	4.47g
Trans fat	-

Soy Protein

Soybeans are among the best sources of plant-based [protein](#). The protein content of soybeans ranges from 36 to 56% of the dry weight. One cup of boiled soybeans (172 g) contains around 29 grams of protein. The nutritional value of soy protein is good, although the quality is not quite as high as animal protein. The main types of protein in soybeans are glycinin and conglycinin, which make up approximately 80% of the total protein content. These proteins may trigger allergic reactions in some people. Consumption of soy protein has been linked with a modest decrease in cholesterol levels. Soybeans also contain bioactive proteins, such as lectin and lunasin, which may have anti-cancer

properties. Soybeans are a very rich source of plant-based protein, making them ideal for vegan diets.

Soy Fat

Soybeans are rich in fat. In fact, soybeans are classified as oilseeds and are often used to make soybean oil. The fat content is approximately 18% of the dry weight, mainly polyunsaturated and monounsaturated fatty acids, with small amounts of saturated fat. The predominant type of fat in soybeans is linoleic acid, accounting for approximately 50% of the total fat content. As a good source of fat, soybeans are used in the production of soybean oil.

Carbs

Being low in [carbs](#), whole soybeans are very low on the glycemic index, which is a measure of how foods affect the rise in blood sugar after a meal. The low glycemic index makes soybeans particularly suitable for people with diabetes.

Fibers

Soybeans contain a fair amount of both soluble and insoluble [fibers](#). The insoluble fibers are mainly alpha-galactosides, such as stachyose and raffinose. These fibers may cause flatulence and diarrhea in sensitive individuals ([13](#), [14](#)). Alpha-galactosides belong to a class of fibers called FODMAPs, which may exacerbate the symptoms of irritable bowel syndrome (IBS) ([15](#)). Despite unpleasant side effects in some people, soluble fibers in soybeans are generally considered to be healthy.

They are fermented by bacteria in the colon, leading to the formation of short-chain fatty acids, such as butyrate, which may improve colon health and cut the risk of colon cancer ([16](#), [17](#)). Soybeans are low in carbs, but fairly high in fiber. The fiber is good for colon health, but may cause digestive problems in some people.

Vitamins and Minerals

Soybeans are a good source of various vitamins and minerals.

- Molybdenum: Soybeans are rich in molybdenum, an essential trace element, primarily found in seeds, grains and legumes ([18](#)).
- Vitamin K1: The form of vitamin K found in legumes is known as phyloquinone. It plays an important role in blood clotting ([19](#)).

- Folate: One of the B-vitamins, also known as vitamin B9 or folic acid. It has various different functions in the body and is considered to be particularly important during pregnancy (20).
- Copper: Dietary intake of copper is often low in Western populations. Copper deficiency may have adverse effects on heart health (21).
- Manganese: A trace element found in most foods and drinking water. Manganese is poorly absorbed from soybeans because of their high phytic acid content (22).
- Phosphorus: Soybeans are a good source of phosphorus, an essential mineral that is abundant in the Western diet.
- Thiamin: Also known as vitamin B1, thiamin plays an important role in many body functions.
- Soybeans are a good source of several vitamins and minerals, including vitamin K1, folate, copper, manganese, phosphorus, and thiamin.

Soybean and Nutrition Security

The unique chemical composition of soybean seed, which includes the number of nutraceutical compounds such as isoflavons, tocopherol, and lecithin besides 20 % oil and 40 % protein, has made it one of the most valuable agronomic crops in India. The food derived from soybeans generally provides the health benefits and is a cheaper source of high-quality protein. The crop has potential to eliminate protein malnutrition prevailing in poor sections of society in the country. The soy meal is encouraging draining out of high-quality protein which poor sector of society needs at an affordable price. The utilization of soybean for food uses in India is meager [2], and it needs work in terms of blending with other foods to make taste acceptable. The high-quality soybean protein should be included in daily diet of Indian masses to mitigate the widespread energy-protein malnutrition. The Government of India as well as private sector should take aggressive approach to increase the food use of soybean in the country.

Varieties having specific characters	
Character	Varieties
Resistance to pod shatterin	PK 472, PK 416, JS 335, NRC 7, NRC 37, Bragg, JS 71-05 and most of the new varieties
Tolerance to drought	NRC 7, JS 71-05, Hardee
Tolerance to excessive soil moisture	JS 97-52
Good seed longevity	JS 80-21, NRC 37, Punjab 1, NRC 2, JS 335, Kalitur
Suitable for mechanical harvesting	MACS 58, NRC 37, Type 49, Durga, Punjab 1
Suitable for summer cultivation	MACS 57, Punjab 1, JS 335, Pusa 16, PS 564
Suitable for delayed sowig reduced row to row distance	JS 335, Ahilya-1, PK 472, Punjab 1 etc. Increased seed rate and
Resistance to lodging	JS 71-05, Pusa-16, Ahilya-1
Low trypsin inhibitor	Hardee, Punjab 1
Low lipoxygenase	Shilajeet, KHSb 2, Punjab 1,
High protein (>40 %)	ADT 1, MACS 58,
High oil (>20 %)	NRC 7, VLS 1, PK 416
Low linolenic acid	VLS 59
High oleic acid	LSb 1
High isoflavones	Hardee, ADT 1

Low oligosaccharide	SL 525
Tofu quality	Punjab 1, Hardee, PK 472
Collar rot or sclerotial blight	NRC 37, PS 1225
Rust Indira Soya 9	Rust tolerant varieties like Ankur, PK 1024, PK 1029, JS 80-21,
early maturing varieties	Phakopsora pachyrhizi Myrothecium
leaf spot Resistant/moderately	JS 71-05, JS 335,
Yellow mosaic	PK 1042, SL 525, SL 688,
Mung bean yellow mosaic virus	Pusa 9712, JS 97-52
Girdle beetle	NRC 12, NRC 7, Bragg, Indira Soya 9, JS 93-05
Defoliators	NRC 12, NRC 7, JS 80-21, JS 90-41
Monetta, Blue beetle	(Cneorane RAUS 5, Pusa 16, JS 95-60 sp.)
Tobacco Caterpillar	Bihar Hairy Caterpillar
Stem fly	JS 335, NRC 12, NRC 7, JS 90-41, JS 93-05, , JS 95-60

Future Challenges

The productivity of soybean India though has increased from 426 kg/ha in 1970–71 to 1,264 kg/ha in 2011–12, which is still much below the potential of the crop in India. Thus, the poor productivity and great fluctuation in climate and yield are detrimental in India. Simulation studies carried out across India have revealed that the climatic potential of the crop is 3,000–3,500 kg/ha, while rainfed potential is 2,000–2,500 kg/ha as against national average of 1,100 kg/ha [1]. The average rainfed potential of 2,000 kg/ha has also been demonstrated in large number of on-farm trials conducted over years across India [3]. Several abiotic, biotic, and socio economic factors, responsible for poor productivity of soybean in India, have been identified ([20]). However, the major cause of large yield gaps between rainfed yield potential and actual yields harvested by farmers is attributed to non-adoption of improved production technology by the farmers. Despite having established non-adoption of technologies as the foremost reason for stagnation of soybean productivity, maintaining the focus on providing the upward thrust to soybean production and productivity in the country in next 20 years to come, the following multi-pronged strategies have been formulated.

- Improving productivity of soybean through development of new gene technologies.

- Enhancing and enriching the gene pool to broaden the selection pool along with gene flagging to assign the worth to our genetic wealth.
- Development of new varieties that would fit into futuristic crop management regimes and can harness the opportunities created by shift in weather patterns.
- Exploitation of heterotic vigor to create an opportunity window for development of hybrids for further increasing the yield potential.
- Exploitation of new biotechnological tools in exercising efficient selection in reduced time frame.
- Development of varieties with efficient extraction metabolism to assimilate ever limiting phosphorous and zinc availability.
- Breeding varieties that could cope with abiotic stresses like water deficit and excesses.
- Using zinc-finger nuclease technology, the trypsin inhibitor and other undesirable genes can be deleted or modified. A thaumatin gene for sweet protein gene and cloning of omega and hydroxyl acids genes can make soybean the most valuable oil crop. There are no limitations of technology. Imagination and bold decisions to do are the scarce virtues holding soybean back.

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1.5 ACRE - A HORTI BASED FARMING SYSTEM MODEL FOR FOOD AND NUTRITIONAL SECURITY TO RESOURCE POOR FARMERS

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ABSTRACT

1.2 hac model introduced by KVK to Small scale farmer to minimize risk of Single crop failure as well as for gaining the profile with the use of multi enterprises. The research summarized in this article establishes direct links between the scale, process, and output of agricultural production by examining the dynamics of intensification, crop diversification, and commercialization. Small farm survey results from Satna District, M.P., show that diversified production provides smallholders with the opportunity to select a particular crop or crops for commercial production (such as Crop, Vegetable, Bee keeping, Dairy,) in order to increase farm-generated income while meeting increasing demands for local farm produce and export crops. The study shows that income per hectare (acre) does not consistently increase with increasing farm size, regardless of the level of commercialization. Smallholders operating at the 1.2 to 1.6 hectare (3–4 acre) scale appear to engage in higher-risk, more diversified, commercial production strategies than those with less area under production. These findings expand upon induced intensification theory and support the thesis that increased agricultural productivity results from both subsistence- and commodity-based production, though the research focuses on the latter.

INTRODUCTION

It is apparent that the development of high yielding varieties of crops and breeds of livestock, and the breeding of strains that possess a broad spectrum of resistance to pests, disease and to diverse soil stress, coupled with good management, had helped to raise the crop and livestock productivity to high levels.

The large-scale cultivation of improved crop varieties together with efforts to maintain good soil fertility and water management helps to increase production through higher yield per hectare. Land is a shrinking resource for agriculture. A rational land use plan is needed to increase agricultural production by achieving higher yields per ha through intercropping, multiple cropping and increasing cropping intensity. With the increasing pressure of population on agriculture land, it is now increasingly being felt at the international level, that for meeting the food requirements of the increasing population, more land will have to be brought under cultivation. But India is fortunate to have good potential for increasing productivity, as the productivity in our farming system

is far behind its actual potential. The country will have to accord high priority to reducing the gap between realizable and actual yields in farmers' fields by identifying and removing the constraints responsible for the yield gaps.

After independence, our agricultural policies were influenced greatly by the needs of big landlords. As a result, the needs of the large majority of small peasants were neglected. That is why even after 61 years of independence, three-fourth of our agricultural land remains uneconomical. Because of this lacuna in our agricultural policies, small farmers remain below the poverty line, and our country has not prospered agriculturally. More than 80% of Indian farmers own two and half acre or less land. Their share of cultivated land is about a third of the total available agricultural land in the country. Over time, due to high population growth that caused a division of land holdings, and a very slow growth rate of the rural economy, the pressure on land has been steadily increasing and the number of small and marginal farmers has been

growing. These farmers can play a leading role in the development of the country by contributing to the nation's capital formation, if their uneconomic holdings are converted into economic ones. However, with the traditional cropping system, small and marginal farmers are finding it difficult to produce adequate food to feed their families. The only way to convert these holdings into profit-making ones is through the intensive use of land through diversification of crops. So, in order to improve the economic and social status of these targeted groups of farming community, an effort was made by Deendayal Research Institute to develop some technologies for the benefit of marginal farm families. In this regard, a 2.5 and 1.5 acre horticulture-based farming system model were formulated and tested at the KVK, farm, Satna, with the objective of providing sustainable food and nutritional security along with sufficient income. After the success of these models at the KVK farm, the models were replicated at farmer's fields for further validation and to help spread it to other neighboring farmers. The guidelines followed in selecting the crops and cropping systems are presented hereunder.

1.5-acre model (irrigated + rain fed). A step-by-step guide :

Know the family requirement of food

Calculate the annual food requirements of a family by taking the average balanced diet requirements for men and women for moderate type of work, as per the recommendations of National Institute of Nutrition, Hyderabad or ICMR, New Delhi.

Area allotment to crops

Allot cultivation area to each crop as per the food requirements of the farm families keeping in view the average productivity of crops in the region, giving maximum acreage to cash crops.

Layout and Planning of field

Plan the types of crops to be grown as per the resources available with the farm family and suitability of crops to the region.

Crop calendar

Plan the crop calendar for the whole year. (Follow appropriate crop rotations, inter cropping, multiple cropping and guard cropping as per the recommendations made by the State Agricultural University (SAUs) for the region.)

Selection of crop varieties

Select improved varieties that have resistance to major diseases and insect pests.

Crop Production Technology

Follow the improved package of practices for planned crops as per the recommendations of SAUs.

Achievements

The KVK at Satna has validated the model on 1.5 acre in Deora village in Majhgawan Tehsil during 2004-05, 2005-06 and 2006-07. The results obtained on the 1.5-acre farm of Shri Ansuiya Kushwaha, as presented below, corroborate the concept of farm planning on a small land holding as per family requirement.

Shri Ansuiya Kushwaha of village Deora in Majhgawan Tehsil, having 6 family members possess 1.5 acre of land. Detailed survey of the farm family conducted in year 2005 revealed that the farmer despite having 1.5 acre of land and a well –perennial source of water, was not in a position to earn enough to feed his family well. The causes of low income were found to be under utilization of available resources and traditional system of farming. The cropping pattern being adopted by the farmer was Paddy - wheat.

Details of farming situation, crop yield and income. (Before intervention.)

Sr. No.	Year	Soil Type	Area (acre)		Crop	Yield (Kg)	Income (Rs.)
1	2004-05	Sandy Loam	Kharif	1.50	Paddy	1550	8680
			Rabi	1.50	Wheat	1630	11002.50
	Total					3180	19682.50

The farmer was getting 31.80-quintal yield with gross income of Rs. 19,682.50 by investing Rs. 2,453 on purchase of critical inputs (seeds, diesel, fertilizers and pesticides). Whereas, the annual family expenses (food, clothes, education, house maintenance, social functions and miscellaneous) were calculated as Rs. 37,339.00, thus showing a deficit of Rs. 20,109.00 per annum.

Methodology

With a view to convert uneconomical landholding into economical one, intensive cultivation on one and half acres of land was undertaken with the active participation of farm family during 2005-06 and 2006-07 in line with the concept of 1.5 acre land holding utilization. The requirements of food grains, pulses, oilseeds vegetables and fruits as computed for the 6- member family has been set out below.

Basic food requirement of a Five-member family. (According to NIN, Hyderabad.)

Particulars	Per head per day requirement (gm.)	Food requirement/ Annum (kg)	Family requirement + 5% surplus for family guest
Cereals	425	930.75	977.29
Rice	200	438	459.90
Wheat	225	492.75	517.39
Pulses	70	153.3	160.97
Oils	35	76.65	80.48
Vegetables	285	624.15	655.36
Leafy	100	219	229.95
Tubers and roots	85	186.15	195.46
Other vegetables	100	219	229.95
Milk	214	468.66	492.09
Fruits	140	306.6	321.93

Total requirement of family (Food requirement of family + 5% surplus for family guest + Seed for next year.

Sl. No.	Particulars	Family requirement +5% surplus for family guest (Kg) (a)	Seed for next year sowing (Kg) (b)	Total requirement (Kg) (c)
01	Cereals (food grains)	1224.93	40	1264.93
	Paddy (65% yield when converted to rice)	707.54	20	727.54
	Wheat	517.39	20	537.39

02	Pulses	160.97	13	173.97
	Blackgram		1.5	
	Greengram		1.5	
	Gram		10	
03	Oilseeds	278.5	8.5	287
	Mustard (33% yield when converted to oil)	151.5	0.5	152
	Soybean(24% yield when converted oil)	127	8	135
04	Vegetables	655.36		655.36
	Leafy	229.95		229.95
	Tubers and roots	195.46		195.46
	Other vegetables	229.95		229.95
05	Spices	149.48		149.48
	Chillies	5.75		5.75
	Turmeric	5.75		5.75
	Ginger	11.50		11.50
	Garlic	5.75		5.75
	Onion 114.98	114.98		114.98
	Coriander 5.75	5.75		5.75
05	Milk	492.09		492.09
06	Fruit	321.93		321.93

In the 1.5-acre model, the cropping pattern being followed by the farmer was changed. The planning and layout of field was done on the basis of food requirement of the family. The area under each crop was allotted on the basis of average productivity of crop in the region. Crop calendar for the whole year was prepared to enable the farmer to perform various cultural operations timely as shown in the following layout plan.

Layout and planning of field

Kharif

Paddy– 0.5 acre						
Soybean - 0.25 acre	Brinjal 0.03acre	Tomato- 0.1acre	Okra- 0.06acre	Lobia- 0.03acre	Spinach - 0.03acre	Radish- 0.03acre
Blackgram -0.25 acre	Chilli- 0.1acre		Cucurbits- 0.08 acre	Turmeric- 0.01acre	Ginger-0.05 acre	

Rabi

Mustard– 0.25 acre			Gram - 0.25 acre			
Wheat– 0.5 acre	Radish- 0.05acre	Pea 0.05 acre	Tomato 0.03 Acre	Potato - 0.13 acre	Cauliflower - 0.05 acre	Carrot- 0.01acre
	Coriander – 0.03 acre		Onion-0.05 Acre	Garlic - 0.05 acre	Turmeric- 0.01acre	Ginger -0.05 acre

Zaid

Moong – 0.25 acre			Fallow - 0.25 acre			
Fallow-0.5 acre	Lobia-0.05acre	Tomato 0.05 acre	Fallow 0.03 Acre	Cucurbits - 0.13 acre	Okra - 0.05 acre	Fallow-0.01acre
	Radish – 0.05 acre		Spinach-0.05 Acre	Coriander - 0.05 acre	Fallow-0.01acre	Fallow-0.03 acre

Findings

The production obtained from crop-based enterprises on the respective allotted areas is furnished below. It is apparent from the production data the intensive cultivation model resulted in substantial increase in yield and income over the traditional system of cropping. Shri Kushwaha has harvested 13.22 and 13.35 quintal food grains; 3.48 and 3.81 quintal pulses; 3.19 and 3.14 quintal oilseeds; 54.49 and 60.93 quintal vegetables; 5.38 and 5.89 quintal spices during the year 2005-06 and 2006-07 respectively, which is more than his annual requirement of food grains (12.65 quintal), pulses (1.74 quintal), oilseeds (2.87 quintal), vegetables (6.55 quintal) and spices (1.50 quintal). The production of year round vegetables (47.94 and 54.37 quintal) was so excess than required (6.55 quintal) that gave Shri Kushwaha an opportunity for earning cash through sale of the surplus vegetables. Spices production was to the tune of 3.88 and 4.39 quintal during the year 2005-06 and 2006-07 respectively, which again offered scope for cash earning.

Table -1 Data showing crop yield and income from 1.5 acre land holding

Crops	Total Family requirement (c)	Production (Kg.)		Gross Income		Surplus production after meeting family requirement (c)		Value of the surplus produce (Rs.)	
		2005-06 (d)	2006-07 (e)	2005-06	2006-07	2005-06 (d-c)	2006-07 (e-c)	2005-06	2006-07
Cereals	1264.9	1322.0	1335.0	9183.0	9475.5	57.1	70.1	418.7	1044.4
Paddy	727.5	732.0	705.0	4758.0	4852.5	4.5	-22.5	24.1	349.8
Wheat	537.4	590.0	630.0	4425.0	4623.0	52.6	92.6	394.6	694.6
Pulses	174.0	348.0	381.0	6972.0	8107.0	174.0	207.0	3457.2	4337.0
Urad	58.0	68.0	53.0	1428.0	1219.0	10.0	-5.0	210.0	-115.0
Moong	58.0	51.0	47.0	1173.0	1034.0	-7.0	-11.0	-161.0	-242.0
Gram	58.0	140.0	164.0	2772.0	3444.0	82.0	106.0	1623.0	2226.0
Oilseeds	287.0	319.0	314.0	4730.0	4739.0	32.0	27.0	489.4	400.5
Soybean	152.0	165.0	168.0	2112.0	2184.0	13.0	16.0	166.4	208.0
Mustard	135.0	154.0	146.0	2618.0	2555.0	19.0	11.0	323.0	192.5
Vegetables	655.4	5449.0	6092.0	29139.6	35282.9	4793.6	5436.6	25474.8	31188.1
Leafy	230.0	569.0	657.0	3638.8	4892.2	339.1	427.1	2169.9	3181.5
Tubers & Roots	195.5	1642.0	1795.0	7948.4	9693.0	1446.5	1599.5	7001.3	8637.5
Others	230.0	3238.0	3640.0	17552.4	20697.7	3008.1	3410.1	16303.6	19369.1
Spices	149.5	537.8	588.8	7906.6	8380.0	388.3	439.3	6661.2	7446.1
Chillies	5.8	41.0	46.0	1558.0	1840.0	35.3	40.3	1339.5	1610.0
Turmeric	5.8	10.8	12.8	399.6	512.0	5.1	7.1	186.9	282.0

Ginger	11.5	187.0	209.0	2618.0	2508.0	175.5	197.5	2457.0	2370.0
Garlic	5.8	154.0	143.0	2556.4	2574.0	148.3	137.3	2461.0	2470.5
Onion	115.0	134.0	169.0	455.6	676.0	19.0	54.0	64.7	616.1
Coriander	5.8	11.0	9.0	319.0	270.0	5.3	3.3	152.3	97.5
Fruits	321.9	163.0	356.0	1589.3	3669.5	-156.9	36.1	-1549.6	370.0
Total	2852.7	8138.8	9068.8	59520.5	69653.9	5286.1	6216.1	34951.7	44786.1
Milk	492.09	536	584	5896	7008	43.91	91.91	483.01	1102.9
	3344.8	8674.8	9652.8	65416.5	76661.9	5330.0	6308.0	35434.7	45889.0

*Prices of produce were calculated on the basis of prevailing rates in the local market.

The farmer obtained gross income of Rs.65, 417 and Rs.76, 662 from the same holding by investing Rs. 7,640 and Rs 5,670 on purchase of critical inputs (seeds, diesel, fertilizers and pesticides). Comparative advantage made between before and after intervention based on the commodity price structure prevailed during 2005-06 and 2006-07 reveals that Shri Kushwaha could have earned net income of Rs.17, 230 from his 1.5 acre farm which he has obtained Rs.58, 777 and Rs.70, 992 from the same holding by application of 1.5 acre model farming systems. An increase in net income by Rs. 41,547 and Rs.53, 762 respectively during the year 2005-06 and 2006-07 per annum from 1.5 acre is indeed substantial. After excluding all the annual family expenses, a net saving of Rs. 18,095.00 and Rs. 29,049.00 was achieved during the year 2005-06 and 2006-07 respectively. Further, it is praiseworthy to mention that the 1.5-acre model farming was visited by Correspondent of India Today and could find place in the Magazine. Shri Kushwaha has received first prizes each on seven (7) occasions in 2006-07 in district level kisan melas differently for the enterprises he has raised in 1.5 acre, which also indicates his conviction and devotion to use the small land holding into profitable mode using the model. The findings narrated above are from one out of seven (7) sites in different villages implemented by the KVK Satna on 1.5 acre. Similar findings have also been recorded from the other six (6) sites.

Table 2. Annual family expenses & net saving:

Sr.No.	Particulars	2005-06	2006-07
01	Foods	29,982.00	30773.00
02	Clothes & Education	3,700.00	3,900.00
03	Social functions	1,850.00	2,540.00
04	House Maintenance	1,000.00	1,000.00
	Medical Treatment	2,300.00	1,240.00
05	Miscellaneous	1,850.00	2,500.00
	Total Expenditures	40,682.00	41,953.00
	Net income	58,777.00	70,992.00
	Net Saving	18,095.00	29,039.00

Conclusion

From the above results it can be concluded that crop diversification by incorporating pulses, oilseeds, vegetables and other cash crops in a scientific cropping pattern can play an important role in increasing farm incomes and employment to achieve nutritional security. Further, as the average family land holdings at the national level have come down, interventions are further needed to convert such uneconomic landholdings into profitable one. Such studies can make a difference to the livelihood as well as food & nutritional security to the people. As such, the focus of extension functionaries should shift to farming system diversification.

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