

Vision - 2035



**RAJMATA VIJAYARAJE SCINDIA KRISHI VISHWAVIDYALAYA
GWALIOR 474002, (MADHYA PRADESH)**



RAJ BHAVAN
Bhopal - 462 052

PHONE : 0755-4080170
FAX : 0755-4080172

Ram Naresh Yadav

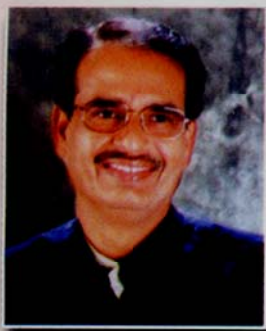
MESSAGE

It is a matter of pleasure to know that the Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya, Gwalior has brought out the university's first vision document "Vision 2035" for publication.

I hope that the document will prove useful for the researchers, policy makers and stake holders to address the future challenges for growth and development of the agricultural sector and ensure the level of living of rural people, availability of sufficient food and income security with a human touch.

My best wishes.

Ram Naresh Yadav
(Ram Naresh Yadav)



Government of
Madhya Pradesh
Bhopal - 462 004

S.No. 265,
21 April, 2012

Shivraj Singh Chouhan

Chief Minister

MESSAGE

I am happy to know that the Rajmata Vijayaraje Scindia Krishi Vishwavidyalaya, Gwalior is publishing "Vision 2035" document propose strategies for the coming two decades.

Madhya Pradesh is privileged to have diverse agroclimatic conditions, soil types and socio-economic strata. I am sure that the document will prove a guide to scientists, policy makers and stakeholders inspiring them to design action plan for development of agriculture in the state. I record my appreciation for building the "Vision 2035".

Regards.


(Shivraj Singh Chouhan)



मंत्रालय कक्ष क्रमांक . 543
दूरभाष : 0755-2441438 (मंत्रालय)
0755-2661299, 2661370 (नि.)
0755-2660516 (फैक्स)
ई-मेल : minagri@mp.gov.in
निवास - बी-3, श्यामला हिल्स,
भोपाल (म.प्र.) 462002

पत्र क्रमांक 1149
भोपाल, दिनांक 20.04.2012

डॉ. रामकृष्ण कुसमरिया

मंत्री
किसान कल्याण एवं कृषि विकास
मध्य प्रदेश

सन्देश

मुझे यह जानकर हार्दिक प्रशन्नता हो रही है कि राजमाता विजयाराजे सिंधिया कृषि विश्वविद्यालय, ग्वालियर द्वारा एक दृष्टि 2035 नामक दस्तावेज उच्च कृषि शिक्षा अनुसंधान एवं कृषि विस्तार की रणनीति को दृष्टिगत रखते हुये तैयार किया जा रहा है। कृषि विकास की दिशा में यह एक अच्छा प्रयास है।

आशा करता हूँ कि यह दस्तावेज प्राकृतिक संसाधनों विशेष रूप से जल एवं भूमि के संरक्षण, सुरक्षा और कृषि उत्पादकता बढ़ाने की दृष्टि से उपयोगी साबित होगा।

शुभकामनाओं सहित।

आपका

(डॉ. रामकृष्ण कुसमरिया)



Prof. V. S. Tomar
Vice Chancellor

Foreword

It has been known since ancient times that agriculture is the backbone of the nation's economic growth and development. About 5200 years ago, (this fact) was highlighted in Shrimad Bhagwat Gita, Chapter-3, Verse-14 by Lord Krishna. It reads as follows:-

**“अत्राद्भवन्ति भूतानि पर्जन्यादन्न सम्भवः ।
यज्ञाद्भवति पर्जन्यो यज्ञः कर्मसमुद्भवः ॥”**

Mankind has been harnessing the natural resources without caring for their replenishment. This indiscretion has led to diverse problems. Therefore, it is the need of the hour to take care of these resources so that they may be able to support human civilization for all times to come.

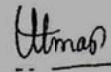
The State of Madhya Pradesh is endowed with high potential of agriculture owing to its diversified natural resources and crops. In spite of this, the agriculture in the State is at a critical stage. Stagnation in production of cereals, erratic behavior of monsoon, cost escalation of different inputs; lower farm income, continual degradation of natural resources and non-availability of quality seed and planting material are some of the hindrances or stumbling blocks which are responsible for the uneconomic scenario of agriculture sector in the State. The State has established two Agriculture and one Veterinary and Animal Husbandry

Universities to work in the realm of agriculture and allied sectors so that they may contribute immensely to the strengthening of the State's economy.

Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya, Gwalior came into existence on August 19, 2008 as the second State Agriculture University. Its territorial jurisdiction spans over 25 districts located in 6 different agro-climatic zones. Although it is new yet it is growing fast and is known for imparting quality education, need-oriented research and farmers' participatory extension of technology in the field of agriculture and allied sciences. We encounter diversified problems in our targeted zones. The mission of the University is to explore new frontiers of science and technology and to develop human resources and policy guidance to create a vibrant, responsive and resilient agriculture in the State. "Making Agriculture A Profitable Business" in these zones is a big challenge to all of us.

Considering the needs, problems, potential and scope for agricultural development in the State, Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya, Gwalior has brought out Vision-2035 a document which highlights the priority areas and outlines programmes that need to be initiated and strengthened with respect to infrastructure, HRD, education, research and extension perspective.

I am confident that "VISION-2035" will prove its worth with regards to conservation, preservation and protection of natural resources, particularly land and water together with and enhancing the productivity, profitability in agricultural sector and improving the level of living of rural people, producing well trained agriculture graduates and post graduates, simultaneously healthy ecosystems, especially in the State of Madhya Pradesh.



V. S. Tomar
Vice Chancellor



Preface

Dr. Y.M. Kool
Dean Faculty of Agriculture

India today is not only self-sufficient in grain production, but has a substantial reserve also. Agriculture in India is the means of livelihood of almost two thirds of the work force in the country. It employs nearly 62% of the country's total population and occupies 42% of its total geographical area. Agriculture, at present, is at a critical juncture. Stagnation of production in cereals, erratic behavior of climate, cost escalation of inputs, lower farm income, degradation and depletion of natural resources, inadequacy in the availability of quality seed and planting material, diversified market demands are some of the burning problems. The Vishwa Vidyalyaya has geared up with research programmes to address some of these issues with the available manpower and resources using cutting-edge technologies like biotechnology and molecular biology, information and communication technology, physical sciences, nanotechnology, etc.

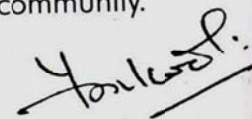
Ever since the establishment of Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalyaya at Gwalior in the year 2008, concerted efforts are being made to improve the quality of agricultural research, education and extension. Its premier colleges, research stations and KVKs located in different parts of the State have served the State by developing appropriate technologies through basic, strategic and need-based research resulting in crop improvement and agricultural productivity. Organic farming is another issue which is engaging our attention.

In view of the changing national needs and the emergence of new problems, it has become essential to redefine goal in agriculture education, research and technology transfer strategies to capitalize emerging opportunities for the betterment of farming community in the State. Now-a-days, the greatest challenge

is to make agriculture a profitable business. Continuing support of GOI, ICAR, State government and coordinated efforts of staff and students of the University will be effective in the implementation of the programmes.

I am thankful to all the honourable members of Board of Management, RVSKW, Gwalior, for their keen interest, guidance and support to elevate this University to new heights. I express my heartfelt gratitude to Dr. V.S. Tomar; founder Vice Chancellor for his leadership in initiating, guidance and inspiration in all the endeavours of the Vishwa Vidyalaya and in the preparation of the perspective plan. The Vishwa Vidyalaya is indebted to Dr. S. Ayyappan, Director General and all senior officers and staff of Indian Council of Agriculture, New Delhi, for their unceasing and valuable support. We express our gratitude to the Ministry of Agriculture and Agriculture Marketing Board for their cooperation. I am extremely thankful to Dr. H.S. Yadav, Director Research Services, Dr. Rajeev Saxena, Registrar, Dr. S.S. Tomar, Director Extension Services, Dr. A.M. Rajput, Director Instructions, all the Deans of the Colleges; Dr. B.S. Baghel, Dr. N.S. Tomar, Dr. Ashok Krishna, Dr. V.S. Gautam and Dr. P.P. Shastry. Thanks are due to Dr. H.B.S. Bhadauria, Dr. S.P.S. Tomar, Dr. A. Chatterjee, Shri. Y.M. Indapurkar, all Associate Director Research, Incharge Research Projects & Regional Research Stations, Programme Coordinators of Krishi Vigyan Kendra and all the staff members under RVSKW, for providing necessary help. I also take this opportunity to appreciate Dr. R.A. Sharma, Ex-Dean, College of Agriculture, Indore, Dr. O.P. Joshi, I/C Ex- Director, Soybean Research (ICAR), Indore and Dr. S.P. Tiwari, Ex-Deputy Director General, ICAR, New Delhi for the consultations provided for this publication.

This perspective plan document (VISION-2035) has been prepared keeping in view the recent developments in international agriculture. We are sure that it will provide the framework for new priorities, new programmes, participatory mode of actions, and organizational adjustments for effectively addressing the new challenges before us and for ushering in an ever green revolution. There is a need to make agriculture a profitable enterprise so that it may help enhanced employment for rural youth and bring prosperity to farming community.



Dr. Y. M. Kool
Dean, Faculty of Agriculture

Contents

1.	Executive Summary	15-18
2.	Agricultural Scenario	19-21
3.	Education, Research and Extension System	27-34
4.	Harnessing Science	35-45
5.	SWOT Analysis	47-53
6.	Challenges and Issues	55-60
7.	Strategy and Framework	61-65
8.	Annexure	67-75

Executive Summary

Established by Govt. of Madhya Pradesh on August 19, 2008 Madhya Pradesh (Ordinance No.4 of 2008 extraordinary Gazette No.507, dated 19th August 2008) and enacted as Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya Act, 2009 (Madhya Pradesh Act No.4 of 2009, dated 12th February 2009), the State Agriculture University (SAU), located in the city of Gwalior, Madhya Pradesh, with its four colleges of agriculture, one college of horticulture, five Zonal Agriculture Research Stations, four Regional Agriculture Research Stations, five sub stations, 23 All India Coordinated Research Projects, and 19 Krishi Vigyan Kendra's spread over 25 districts of its jurisdiction, covering 6 agro-climatic zones of the State. The university represents a well knit and action-oriented net work of research and education centers operating in agriculture and allied fields in the State. Vide notification no. 912-48-इक्कीस-अ-(प्रा.) is also empowered to award degrees as specified by the University Grant Commission (UGC) under section 22 of the UGC act 1956 through its main campus in regular mode with the approval of statutory bodies / councils, wherever required. The overall climate varies from semi arid to sub-humid with hot summer, cool and dry winter and 600 - 1000 mm mean rainfall. The geographical area of the State under the university jurisdiction consists of three types of soils varying from alluvial to medium and heavy black soils.

The mission of the university is to impart education in agriculture and allied sciences, research and extension activities for enhancing productivity, optimization of profit and sustainability of agricultural production systems and improving rural livelihood in the State of Madhya Pradesh. In order to realize the mission, the RVSKVV, Gwalior has the mandate to serve as a centre of higher education, research and technology dissemination in the field of agriculture and allied sciences, to conduct basic and strategic research and to undertake need-based research that leads to sustained crop productivity improvement. The vision of the university aims at steering the policies, strategies, priorities, programs and activities in order to meet the emerging challenges, utilizing opportunities and to play a leading role for the betterment of farming community in the State through quality and cost effective agricultural education, research and extension. The preset document “**Vision- 2035**” takes an overview of challenges and issues and presents a perspective plan.

RVSKVV, Gwalior although established in the year 2008 only, inherit teaching, research and extension establishments for about last over 50 years through its already established colleges

and research centres in different agro-climatic zones of the State which are now in the jurisdiction of this university. Some of the historical landmarks of the university include (i) the establishment of Central experimental farm, Gwalior (1916), Institute of Plant Industry, Indore (1924) and College of Agriculture, Gwalior (1950), (ii) first ever-aerobic technique of composting popularly known as Indore compost developed at Institute of Plant Industry (IPI), now College of Agriculture, Indore by Sir Albert Howard and Yashwant Wad (1931) and later appreciated by Mahatma Gandhi during his visit to IPI, Indore on April 23, 1935, (iii) systematic studies on cultivation and breeding of soybean during late 1960's that triggered the oil seed revolution in having miraculous impact on socio-economic status of farmers and edible-oil-sector in India, and (iv) Madhya Pradesh ranks first in pulses, second in oil seeds and third in cereal production due to adoption of improved crop varieties and matching package of practices developed at various centres of the university.

Through sustained efforts during the past few years this university has been applauded for a significant and far-reaching impact on agricultural education, research and extension. The University has several distinctive features in all the three programs. The notable achievements in education have been substantiated by students' placement in private and public sector organizations of national and international repute.

The major emphasis is being given to crop improvement for diversified farming and making agriculture a profitable business, standardization of potential cropping systems, natural resource management, integrated nutrient management, integrated pest management, nucleus and breeder seed production of major crops, conservation of plant biodiversity and domestication and conservation of medicinal and aromatic plants. The university renders various kinds of general services to improve the quality of education, carrying out research and transfer of technology with a view to enhancing the productivity and profitability of farming community in the region.

The significant contributions of constituent Colleges / Centres of the university are as below:

- First white rust fungal disease resistant variety of mustard, J. Mustard-1 at Morena.
- First variety of coloured cotton, Jawahar Coloured Cotton-1at Khandwa.
- Soybean variety JS 335 at Sehore.
- Technology for water management (watershed) for rain-fed areas and dry land farming at Indore.

Recently, the efforts of RVSKVV scientists have enabled the release of a number of improved varieties of different crops. Some of the improved varieties are gram (JG 6), pigeon pea (TJT 501), wheat (MP 1203), groundnut (JGN 23) and mustard (JM 4) we do hope to embark upon a new era of productivity of these crops in the State during coming years.

Major issues which the university intends to address in future include:

- Reorientation of agricultural education in changing scenario to improve the quality of education,
- Human resource development, including students and faculties,
- Technical strengthening of line departments,
- Sustainable utilization of natural resources with environmental protection,
- Rationalization of cropping system through crop substitution and crop diversification,
- Wasteland development,
- Micro irrigation techniques,
- Promotion of R&D activities in medicinal and aromatic plants,
- Modernizing commercial horticulture,
- Livestock and fodder improvement and management,
- Information technology- reaching the unreached,
- Intensification of KVKs activities,
- Women empowerment and employment oriented trainings,
- Enhancement of seed replacement rate,
- Value addition of farmers' produce,
- Utilization of biotechnological tools to improve plant/crop varieties,
- Soil health management for sustainable crop production,
- Harnessing ITK for developing low input sustainable agriculture (LISA),
- Addressing global warming issues,
- Dry land and rain-fed agriculture,
- Conservation agriculture,
- Precision farming,
- Protected agriculture,
- Bio-industrial agriculture,
- Integrated farming,

- Organic farming,

The main drivers of change and challenges are identified as the possible priority areas of future work for the university. Provision of high quality programs that responds to changing needs of the State and to expectations in higher education to strive for nationally recognized achievements consistent with university mission. Increasing, the production of agriculture and its contribution to economic growth and development, while ensuring sustainable ecosystem management and strategies for adoption to and mitigation of climate change. Planning and efforts are needed for eradicating food insecurity, nutrient deficiencies and unsafe food, in the face of, increasing food prices and high price volatility. Improving livelihood security of population living in rural areas, including small holder farmers (in particular women), in the context of urbanization and changing agrarian structure. The main challenges considering the needs, problems, potential and scope for agriculture development in the State, all the constituent units of the university would need to develop infrastructure, HRD, education, research and extension programs to achieve the goals of Vision 2035.

Agricultural Scenario

The contribution of agriculture to the nation's GDP is declining gradually; the present contribution is around 14 % only. By the year 2035, India's population is likely to be around 1.5 billion while contribution to overall employment is much less and is likely to reduce further considerably. Producing food to meet our future growing needs and to provide employment for buying food remain the key concerns of agriculture. Appropriate strategies are to be worked out to address the emerging issues like soil Salinization, depleting ground water and its pollution (inclusive of arsenic hazard), nutrient imbalance, emergence of new pests and diseases and land, water and environmental degradation, etc. In the fragile and marginal environments including rain-fed areas, rising biotic pressure, lack of suitable soil management systems and inputs to realize the optimum potential of land have been threatening the sustainability of agriculture. To cope with the needs of reclamation of degraded land, loss of biodiversity, deforestation and diminishing farming efficiency to prevent reduction in productivity, increasing profitability and thereby the prosperity also, a need for an era of "evergreen revolution" is to usher in the coming years.

Madhya Pradesh is the State with large variability in crops, soils and environmental conditions. The various agro-climatic zones are Gird, Malwa plateau, Nimar valley, Vindhyan plateau, Jhabua hills and Bundelkhand zone. The State is rich in biodiversity and about 31 per cent of geographical area is under forests. Of the 50 districts, 23 are drought prone, indicating the need to address the problems encountered in rainfed agriculture on priority basis. The State Agriculture University "Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya, Gwalior (M. P.)" is responsible for agricultural education, research and extension in 25 revenue districts (Alirajpur, Ashok Nagar, Badwani, Bhind, Bhopal, Burhanpur, Datia, Dewas, Dhar, Guna, Gwalior, Indore, Jhabua, Khandwa, Khargone, Mandsaur, Morena, Neemuch, Rajgarh, Ratlam, Sehore, Shajapur, Sheopur, Shivpuri, Ujjain) of the State.

The State has been contributing significantly to the production of oil seeds and pulses the country being short of production in both and meets nearly 50% of the need through export/import. The productivity of oilseeds and pulses as well as of other rainfed crops is far below the realizable yield under real farm conditions.

The production technology along with the improved varieties is available to at least double the present national productivity of these crops. Special attention is needed to sustain productivity of these rainfed crops to sustain agriculture in the State.

Five agri - export zones were conceptualized for promoting agriculture in the country in order to fetch remunerative returns to the farming community by the Government of India in the State of Madhya Pradesh. Among the crops covered, except wheat and some seed spices, the remaining crops are rainfed. Focused attention on research needs of these crops to increase productivity with internationally acceptable quality produce will be in favour of national economy and in improving household income of growers. The details of various agri export zones are given as follows

Agri export zones in Madhya Pradesh

	AEZ project	District
1.	Potato, onion, garlic	Malwa (Ujjain, Indore, Dewas, Dhar, Shajapur, Ratlam, Neemuch and Mandasaur
2	Wheat (Duram)	Three distinct and conceptualized zones: Ujjain zone comprising of Neemuch, Ratlam, Mandasaur and Ujjain; Indore zone comprising of Indore, Dhar, Shajapur and Dewas and Bhopal zone comprising of Sehore, Vidisha, Raisen, Hoshangabad, Harda, Narasingpur and Bhopal
3.	Seed spices	Districts of Guna, Mandasaur, Ujjain, Rajgarh, Ratlam, Shajapur and Neemuch
4.	Lentil and gram	Shivpuri, Guna, Vidisha, Raisen, Hoshangabad, Harda, Narasinghpur and Chhindwara
5.	Oranges	Chhindwara, Hoshangabad and Betul

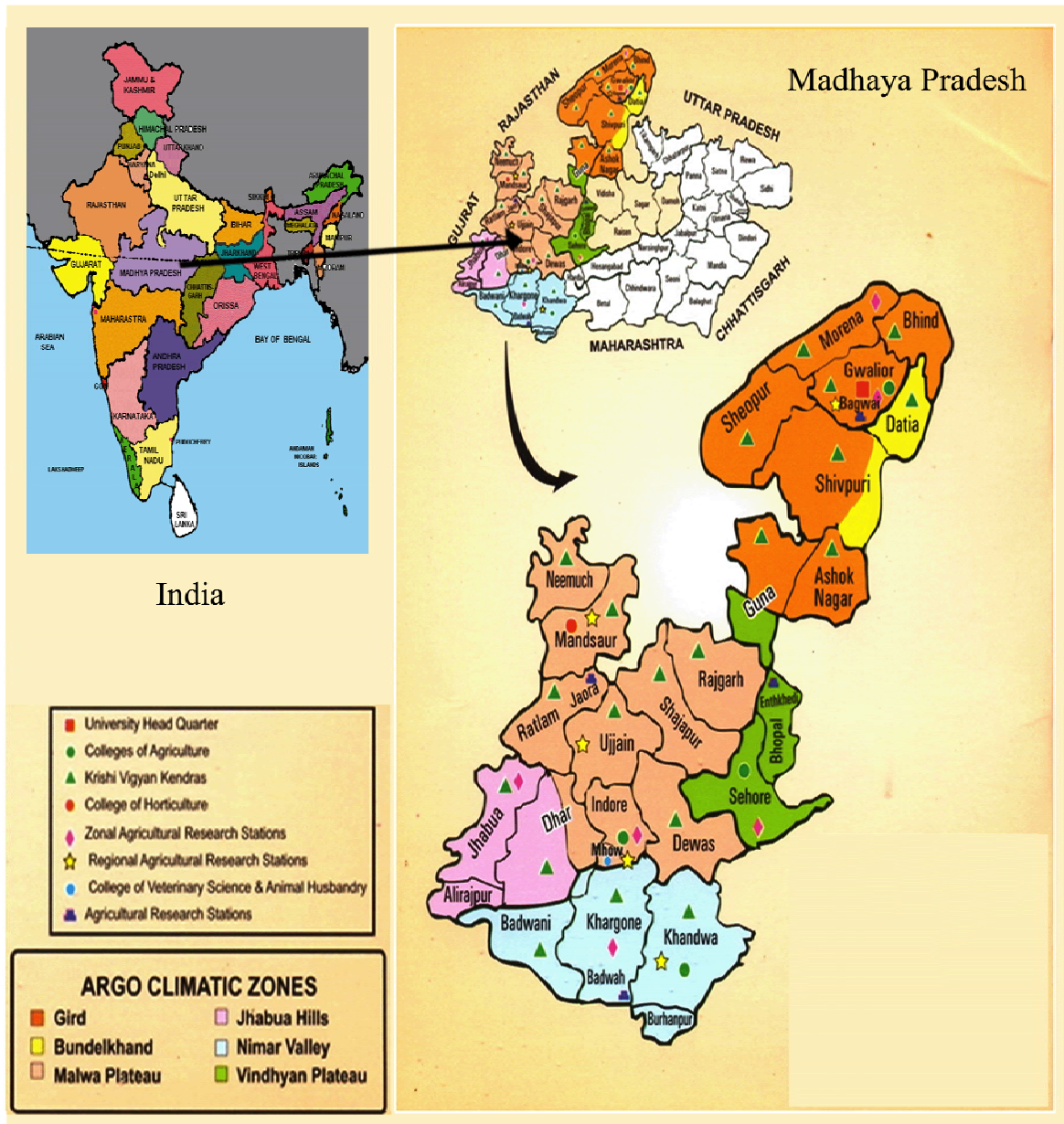
Source: Agri Export Zones – The Concept. Agri-Export Advantage XIV(IV): 8-10

For efficient and sustainable agriculture, it is imperative to shift from a commodity centered approach to farming system approach. This calls for a multidisciplinary effort. Further, the challenge is not only to offer solution to raise production but also to offer these within a time frame. This paradigm shift will call for designing new production systems aligned fully with

carrying capacity of natural resources endemic to a region. This will require emphasis on efficiency, sustainability, diversification, post harvest management, small farm mechanization, marketing and trade. Such an approach requires forging linkages at regional, national and international levels. In order to infuse these new approaches of working, present research set up will have to be empowered to plan and execute their research. Major changes are needed in the HRD programs to train more manpower in frontier areas and reorient education to develop entrepreneurship. Innovative approaches will have to be adopted to upgrade skills of the farmers and technological empowerment of women engaged in agriculture. Harnessing complimentary and synergies through strong linkages required within institutions / agencies at national and international levels in public, cooperative and private sectors.

Organizational, structural and procedural changes in the institutions devoted to agricultural growth and development are required to address the above referred challenges. This would call for emphasis on prioritization, monitoring and evaluation, performance-oriented personnel policies, adequate financial support, modernization, use of informatics and function empowerment of scientists. These demands for a flexible, responsive and autonomous research system with world trade agreement having brought global perspective to agriculture. It is imperative that research will also need to reorient its focus, besides others, on food quality, consumer preferences, environmental concerns and intellectual property rights.

Location of RVSKVV, Madhaya Pradesh, India



0

Fig. :

Constituent Colleges of Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya, Gwalior (M.P.)

College of Agriculture, Gwalior (Estd. 1950)



College of Agriculture, Sehore (Estd. 1952)



College of Agriculture, Indore (Estd. 1959)



College of Agriculture, Khandwa (Estd. 1986)



College of Horticulture, Mandasaur 2002 (College of Agriculture in 1987 -2001)



Education, Research and Extension System

RVSKVV is one of the stake holders in National Agricultural Research System (NARS) contributing significantly to promote agriculture in the country, particularly in the State of Madhya Pradesh.

Mandate

To comprehend the mission laid down by the Vishwa Vidyalaya, i.e., to discover new frontiers of science and knowledge, to build up human resources and policy guidance to create a vibrant, responsive and resilient agriculture, the mandate of the institute is as flowing follows:

- to serve as a centre of higher education and research in the field of agriculture and allied sciences, and as an educational hub for developing academic excellence and expertise in agricultural sciences;
- to disseminate technology to farmers, extension personnel and organizations engaged in agricultural development through various extension programs;
- to conduct need-based basic and strategic research that leads to ecologically sound and economically viable crop improvement for sustained agricultural productivity with an additional focus on value addition;
- to serve as a referral point at the State level by providing proficient direction and guidance for agricultural education, research, extension, and technology appraisal and transfer through need based and target oriented innovative approaches and models;
- basic and strategic research on conservation and efficient utilization of natural resources;
- to develop an exhaustive repository of crop germplasm and to ensure its utilization in basic, strategic and applied research;
- to facilitate transfer of research emanated technologies and to conduct impact analysis through socio-economic research;
- to maintain seed flow of improved varieties through breeder seed and quality seed production;
- to act as a repository of information on rain-fed agriculture in the State, provide leadership and co-ordinate network research within University and between the State Agricultural Universities for generating location-specific technologies for rain-fed areas;
- to act as a centre for training in research methodologies in the fields basic to management of rain-fed farming systems;
- to collaborate with relevant national and international agencies in achieving the above objectives;
- to provide consultancy;

The Rajmata Vijayaraje Krishi Vishwa Vidyalaya, although still in its infancy, is making all out efforts with renewed vigor to bring the agriculture in the State to the forefront in a sustainable way, and generating and disseminating improved technology in crop culture and animal productivity to provide livelihood security to the farmers. To achieve the objective of significantly contributing to national agricultural development, efforts are being made to develop linkages and to seek support from all the stake holders of production system. The linkage has been effective in finding out the bottle necks, addressing them and promoting agriculture in the State. In order to enable the youth to acquire deep knowledge and to understand the challenges posed by the prevailing circumstances while acquiring education may go a long way to direct Indian/State agriculture eco-friendly, sustainable and profitable.

Mission

To conduct education, research and extension activities for enhancing productivity, optimization of profit and sustainability of agricultural production systems and improving rural livelihood in the State of Madhya Pradesh

Focus

- On strengthening agricultural education by way of creating the required infrastructural facilities and improving the quality of education and its ramification to job/business oriented growth; On developing technology for conservation agriculture culminating in sustainability, profitability and environment friendly; On standardization and meticulous promotion of organic farming in selected areas to increase farm income and export earnings; On promotion of diversification (crop, variety, input, cultural management) in agriculture; On use of modern tools of science (Bio-technology and nano-technology) for advancing agricultural research, and ultimately leading to enhanced productivity through genetic enhancement or stress (biotic as well as a biotic) mitigation; On standardization/refinement of processing, preservation, packing techniques and value addition to processed products; On conservation of biodiversity, particularly that of aromatic and medicinal plants; On animal health and care; On promotion of farm mechanization to obtain high productivity and farm prosperity; On entrepreneurship development; On developing KVK as knowledge centre;

The Vishwa Vidyalaya has a system in place to provide agricultural education at various levels and competent staff to impart knowledge in traditional and emerging fields (bio-technology and nano-technology) and to pursue research in challenging fields in agriculture. The university presently has 5 different agriculture colleges that are listed here below.

Details of colleges under RVSKVV

S. No.	Name of college with location	Year of establishment	Degree programs offered
1.	College of Agriculture, Gwalior	1950	B.Sc. (Ag.) M.Sc. (Ag.) (1) Agronomy, (3) Ext. Education (5) Genetics & Plant Breeding (7) Soil Science & Agril. Chemistry Ph.D (1) Agronomy (3) Genetics & Plant Breeding (5) Ext. Education (7) Entomology (9) Plant Pathology
2.	College of Agriculture, Indore	1959	(2) Entomology (4) Fruit Science (6) Plant Pathology (8) Agricultural Economics & F.M. (2) Agricultural Economics & F.M. (4) Soil Science & Agril. Chemistry (6) Fruit Science (8) Vegetable Science
3.	RAK College of Agriculture, Sehore	1952	B.Sc. (Ag.) M.Sc. (Ag.) (1) Agronomy (3) Ext. Education (5) Genetics & Plant Breeding (7) Soil Science & Agril. Chemistry (2) Entomology (4) Vegetable Science (6) Plant Pathology (8) Agricultural Economics & F.M.
4.	BM College of Agriculture, Khandwa	1986	B.Sc. (Ag.)
5.	KNK College of Horticulture, Mandsaur	2002 (1987-2001 as College of Agriculture)	B.Sc. (Hort.) M.Sc. (Hort.) (1) Fruit Science (3) Floriculture & Landscape Architecture (2) Vegetable Science (4) Plantation, Spices, Medicinal & Aromatic Crops

Apart from the administrative set up of the Vishwa Vidyalaya, the technical set up takes care of education, research and extension also At present, RVSKVV is offering bachelors and

masters degree programs in agriculture, horticulture as different colleges, while doctoral degree program in Soil Science and Agricultural Chemistry, Agronomy, Fruit Science, Vegetable Science, Genetics Plant Breeding, Entomology, Plant Pathology, Extension Education and Agricultural economics & F.M. at Gwalior campus only.

The research work under various disciplines lays special emphasis on standardization of potential cropping systems, development of improved crop varieties, natural resource management, integrated approach on plant nutrient management/pest management, plant (including medicinal and aromatic plants), and animal biodiversity conservation, conservation agriculture, processing and value addition, and farm mechanization.

The various Zonal Agricultural Research Stations and Regional Agricultural Research Stations including Agricultural Research Stations and Farms are listed below.

Zonal Agriculture Research Station located in different agroclimatic zones:

1. Agricultural Research Station, Indore (College Campus)
2. Zonal Agricultural Research Station, Jhabua
3. Zonal Agricultural Research Station, Khargone
4. Zonal Agricultural Research Station, Morena
5. Zonal Agricultural Research Station, Sehore (College Campus)

Regional Agricultural Research Stations:

1. Regional Agricultural Research Station, Gwalior (College Campus)
2. Regional Agricultural Research Station, Khandwa (College Campus)
3. Regional Agricultural Research Station, Mandsaur (College Campus)
4. Regional Agricultural Research Station, Ujjain

Agricultural Research Stations:

1. Fruit Research Station, Entkhedi (Bhopal)
2. Agricultural Research Station, Bagwai (Gwalior)
3. Salt Affected Soils Agricultural Research Station, Badwaha (Khargone),
4. Horticultural Research Station, Jaora (Ratlam)

In addition, the RVSKVV is operating All India Coordinated Research Projects (AICRP) sponsored by the Indian Council of Agricultural Research (ICAR) as listed below. Substantial quantities of nucleus and breeder seed of important crop varieties is being produced by

RVSKVV and supplied to continue seed production chain making quality certified seed available to farmers. The research out-come is becoming handy in promoting precision agriculture in the State of Madhya Pradesh.

S. No.	Name of Scheme/Project	Centre
AICRP (All India Coordinated Research Project, Indian Council of Agricultural Research, New Delhi)		
1.	Arid Legumes (Guar)	Gwalior
2.	Pearl Millets	Gwalior
3.	Weed Control	Gwalior
4.	Wheat Improvement	Gwalior
5.	Cotton Improvement	Indore
6.	Cropping System Research	Indore
7.	Dryland Agriculture	Indore
8.	Dryland Agriculture Research (ORP)	Indore
9.	Oilseed (Safflower)	Indore
10.	Salt Affected Soils	Indore
11.	Sorghum improvement	Indore
12.	Maize	Jhabua
13.	Cotton Improvement	Khandwa
14.	Oilseed (Groundnut)	Khargone
15.	Pigeonpea	Khargone
16.	Opium Res ANIP on medicinal & aromatic plant	Mandsaur
17.	STF (Grape)	Mandsaur
18.	Oilseed (Rapeseed & Mustard)	Morena
19.	Water Management	Morena
20.	Chickpea	Sehore
21.	MULLARP	Sehore
22.	Pigeon pea (Sub Centre)	Sehore
23.	Soybean	Sehore

Extension being a State subject, the Vishwa Vidyalaya owns the responsibility to work hand in hand with the State Department of Agriculture, Madhya Pradesh in passing on the research emanated production technology and disseminating to the end users. The RVSKVV also helps in elevating the knowledge of farmers and keeping them abreast with latest technologies to enable them to move towards precision agriculture. Apart from developing skills in the educational program and the extension program, the Vishwa Vidyalaya is ably supported by active services like (i) integrated agro meteorological advisory, (ii) soil water and plant analysis, (iii) Kisan mobile sandesh and (iv) organization of Kisan Gosthis, field days, Kisan melas, various training programs, exposure visits, animal health camps and conducting on farm demonstration. To work out linkages between the research and end users and to refine the imparted technology, the following 19 KVKs are functional under the RVSKVV set up:-

List of Krishi Vigyan Kendra functional under the RVSKVV set up

1	Krishi Vigyan Kendra, Ashok Nagar
2	Krishi Vigyan Kendra, Badwani
3	Krishi Vigyan Kendra, Bhind
4	Krishi Vigyan Kendra, Datia
5	Krishi Vigyan Kendra, Dewas
6	Krishi Vigyan Kendra, Dhar
7	Krishi Vigyan Kendra, Guna (Aron)
8	Krishi Vigyan Kendra, Gwalior
9	Krishi Vigyan Kendra, Jhabua
10	Krishi Vigyan Kendra, Khandwa
11	Krishi Vigyan Kendra, Khargone
12	Krishi Vigyan Kendra, Mandsaur
13	Krishi Vigyan Kendra, Morena
14	Krishi Vigyan Kendra, Neemuch
15	Krishi Vigyan Kendra, Rajgarh
16	Krishi Vigyan Kendra, Shajapur
17	Krishi Vigyan Kendra, Sheopur (Baroda)
18	Krishi Vigyan Kendra, Shivpuri
19	Krishi Vigyan Kendra, Ujjain

Seed Village Scheme

To provide newly developed crop varieties and upgrade the quality of farmer - saved seed, financial assistance for distribution of foundation / certified seed at 50% cost of the seed for production of certified / quality seeds and training on seed production technology to farmers are being provided under this program. Total 300 farmers (each 0.5 areas) are benefitted in *Kharif* and *Rabi* season. The seed produced in these seed villages are preserved / stored till the next sowing season.

KVK News letter

Each KVK issues the News letters quarterly that highlights and circulates the latest news, techniques and methods available in agriculture and its allied sectors for the benefit of farmers at District level. It also includes the previews month's activities and planning for the next three months of the KVK.

Kisan Mobile Sandesh (KMS)

Introduction of Information and Communication Technology (ICT) in the field of agriculture has brought many changes in traditional methods of extension. It enables the dissemination of requisite information at the right time to the right people. This revolution in ICT has made access to the information easy and cost effective to rural masses in general and farming community in particular.

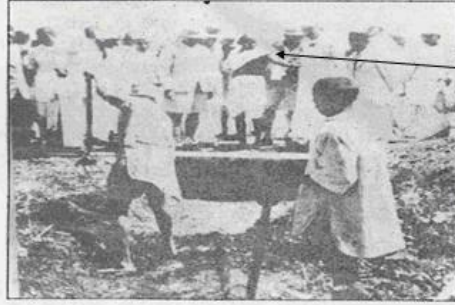
Harnessing Science

Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya is committed to delineate the problems of State agriculture and address them in addition to combat challenges emerging out, particularly by globalization of trade and experienced global climatic changes. This calls for strengthening the agricultural education to make competitive human resource available and systematic research on prioritized areas to resolve problems being encountered and to look for new avenues of global trade by developing improved varieties of crops and value addition to agri-products to promote export. At domestic front, continuous genetic enhancement of crop varieties, promotion of better storage, processing and packing, particularly of horti-products is needed. Dissemination of research emanated production technology and packages will continue to remain the future priority. A proactive action on education and research frontiers is the need of the hour and needs to be taken.

Historical Landmarks

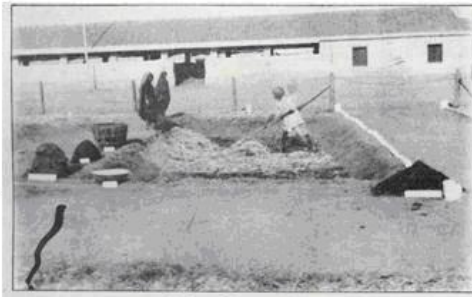
- The establishments of Agriculture Farm, Gwalior (1919), Institute of Plant Industry, Indore (1924), College of Agriculture, Gwalior (1950) are the historical landmarks.
- First ever aerobic technique of composting popularly known as Indore compost was developed at Institute of Plant Industry (IPI), now College of Agriculture, Indore by Sir Albert Howard and Yashwant Wad (1931). It was appreciated by Mahatma Gandhi during his visit to IPI, Indore on April 23, 1935.
- Systematic studies on cultivation and breeding of soybean during late 1960s triggered the oilseed revolution. Its miraculous impact on socio-economic status of farmers and edible-oil-sector in India is a landmark.
- Madhya Pradesh ranks first in pulses, second in oil seeds and third in cereal production due to adoption of improved crop varieties and matching package of practices developed at research centers in the State.

INDORE ON WORLD MAP



THE FATHER OF THE NATION
-MAHATMA GANDHI JI "BAPU"
-INSPECTING
"INDORE METHOD OF COMPOSTING"
AT IFI (INSTITUTE OF PLANT INDUSTRY)
PRESENTLY COLLEGE
OF AGRICULTURE,
INDORE, DURING 23-04-1935

**INDORE
COMPOST PIT
1933**



4

Agricultural Education

Human resource development has been one of the primary responsibilities of the Vishwa Vidyalaya. The RVSKVV is offering Bachelors and Masters degree programs in agriculture and horticulture in its constituent colleges, while Doctoral degree program in Soil Science and Agricultural Chemistry, Agronomy, Genetics Plant breeding, Entomology, Plant Pathology, Extension Education, Agricultural Economics & F.M., Fruit Science and Vegetable Science is being offered at University head quarter at Gwalior campus only. In the academic year of 2011-12, a total of 1918 students (1401 boys and 517 girls) pursued their studies and there existed intake capacity of 671 (467 boys and 204 girls) in 2011-2012. With the future growth of RVSKVV in terms of essential subjects and newer proposed constituent colleges, adequate strengthening in terms of staff, infrastructure facilities, equipment, and educational aids will be the key to produce adequate number of qualified persons and in taking State agriculture to new heights. The constituent colleges although laying no stone unturned to impart quality education to the students; there is a need to strengthen the number of qualified staff as several new courses are awaiting initiation. Need-based upgradation of faculty is the bare necessity by way of their exposure/training in State of art laboratories/institutions in the country and abroad. RVSKVV proposes to further develop strong linkages with leading organization in India and abroad for this

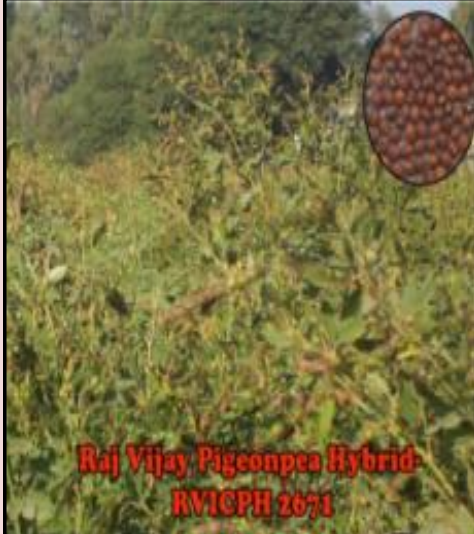
purpose and plan provide opportunity to the teachers and researchers to avail the facility of upgrading their knowledge and skills through bilateral arrangements under MOUs with other countries. Conductance of regular summer/winter schools shall further add to this endeavour. The Vishwa Vidyalaya should initiate new degree programs in deficit areas like Forestry, Home Science, Agricultural Prosiess Management, Food Processing and Technology, Bachelor of Agri.Buisness Adminstration, etc.,


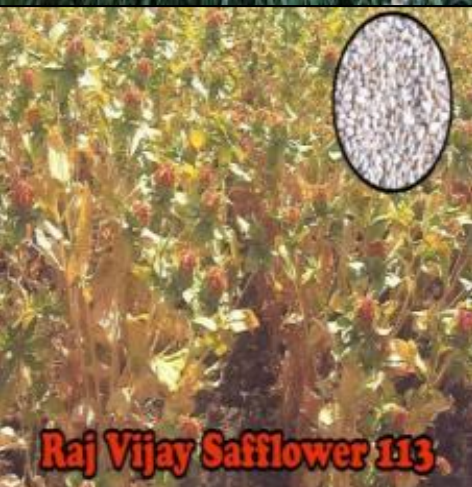

To cater to the education, research and extension needs of the area under the jurisdiction of the Vishwa Vidyalaya, (i) five new agricultural colleges for tribal regions of agro-climatic zones, (ii) College of Food Processing and Technology, (iii) College of Agricultural Engineering and Technology, (iv) College of Agri-business Management Studies are essentially needed and be initiated in a phased manner.

Genetic Improvement of Major Crops




The constituent campuses of the University have legacy of development and popularization of several varieties of important crops grown in the State. The research set up operating at different agricultural colleges has developed various crops grown in the State.

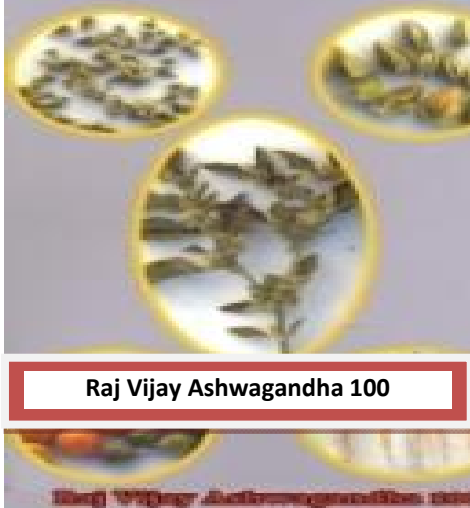
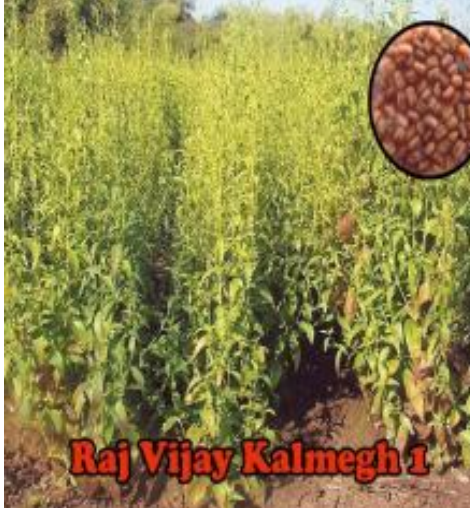

The following varieties of different crops have been released/after establishment of the university in 2008.


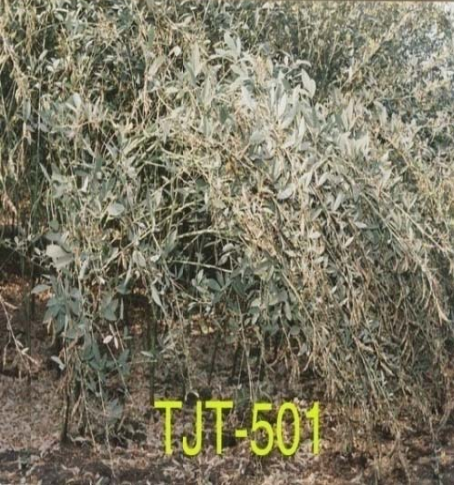

Name of Variety:	<i>Pigeon pea - RVICPH 2671:</i>	
Year of release:	2010	
Average yield:	2276-2852 kg/ha	
Recommended area of adoption	Recommended for the medium <i>Vertisols</i> of M.P.	


<p>Name of Variety:</p> <p>Year of release:</p> <p>Average yield:</p> <p>Recommended area of adoption:</p>	<p>Wheat - RVW 4106:</p> <p>2010.</p> <p>5035 kg/ha.</p> <p>Recommended for late sown irrigated areas of M.P.</p>	
<p>Name of Variety:</p> <p>Year of release:</p> <p>Average yield:</p> <p>Recommended area of adoption:</p>	<p>Safflower- RVS 113:</p> <p>2010</p> <p>1600-1800 kg/ha</p> <p>Recommended for rainfed sole and intercropping conditions in sequential cropping system in M.P.</p>	
<p>Name of Variety:</p> <p>Year of release:</p> <p>Average yield:</p> <p>Recommended area of adoption:</p>	<p>Soybean - RVS 2001-04:</p> <p>2010</p> <p>2495 kg/ha.</p> <p>Recommended for the rainfed areas of M.P.</p>	

Raj Vijay Soybean 2001-04

<p>Name of Variety:</p> <p>Year of release:</p> <p>Average yield:</p> <p>Recommended area of adoption:</p>	<p><i>Lentil - RVL 31:</i></p> <p>2010</p> <p>1200-1300 kg/ha.</p> <p>Recommended for timely sown rainfed areas in M.P.</p>	
<p>Name of Variety:</p> <p>Year of release:</p> <p>Average yield:</p> <p>Recommended area of adoption:</p>	<p><i>Gram - RVG 201:</i></p> <p>2010</p> <p>2000-2500 kg/ha.</p> <p>Recommended for timely sown rainfed conditions in sequential cropping system</p>	
<p>Name of Variety:</p> <p>Year of release:</p> <p>Average yield:</p> <p>Recommended area of adoption:</p>	<p><i>Safed Musali- RVSM 414</i></p> <p>2010</p> <p>1656-2370 kg/ha</p> <p>Recommended for timely sowing under rich humus and well drain soils in raised bed system in M.P.</p>	<div data-bbox="1036 1163 1487 1226" style="border: 2px solid red; padding: 5px; text-align: center;"> <p>Raj Vijay Gram 201</p> </div> 

<p>Name of Variety:</p> <p>Year of release:</p> <p>Average yield:</p> <p>Recommended area of adoption:</p>	<p>Ashwagandha - RVA 100:</p> <p>2010</p> <p>600-700 (Dry root) kg/ha.</p> <p>Recommended for sowing in IInd fort night of July to Ist week of August in sandy loam and well reclaimed soil in M.P.</p>	
<p>Name of Variety:</p> <p>Year of release:</p> <p>Average yield:</p> <p>Recommended area of adoption:</p>	<p>Kalmegh - RVK 1:</p> <p>2010</p> <p>3140 kg/ha in rainfed and 5500-6000 kg/ha in irrigated condition.</p> <p>Recommended for <i>Kalmegh</i> growing areas of M.P.</p>	
<p>Name of Variety:</p> <p>Year of release:</p> <p>Average yield:</p> <p>Recommended area of adoption:</p>	<p>Sarp Gandha - RVSP 1:</p> <p>2010</p> <p>2700-2800 (root) kg/ha.</p> <p>Recommended for <i>Sarp Gandha</i> growing areas of M.P.</p>	

<p>Name of Variety:</p> <p>Year of release:</p> <p>Recommended area of adoption:</p>	<p><i>Gram - JG 6:</i></p> <p>2009</p> <p>Suitable for rainfed farming .</p>	 <p>JG 6</p>
<p>Name of Variety:</p> <p>Year of release:</p> <p>Recommended area of adoption:</p>	<p><i>Pigeon pea- TJT 501:</i></p> <p>2009</p> <p>M.P., Chhatisgarh, Gujrat, Maharashtra and part of Rajasthan and Uttar Pradesh</p>	 <p>TJT-501</p>
<p>Name of Variety:</p> <p>Year of release:</p> <p>Recommended area of adoption:</p>	<p><i>Wheat - MP 1203:</i></p> <p>2009</p> <p>Suitable for late soon conditions of M.P., Chhattisgarh, Gujarat and part of Rajasthan</p>	 <p>M P 1203</p>

Name of Variety:	<i>Groundnut - JGN 23:</i>	
Year of release:	2009	
Recommended area of adoption:	Recommended for M.P.	

The efforts to develop high yielding varieties, varieties with desirable quality characters, varieties with resistance with abiotic and biotic stress are proposed to be continued with renewed thrust so that newer improved varieties can be made available before earlier popular varieties of crops degenerate.

Crop production

Skewed and imbalanced nutrient management turned out as one of the major factor controlling the yield performance of different crops. Resorting to integrated approach for nutrient management proved to be substantial yield booster for several crops (soybean, chickpea, mustard, lentil, and cluster bean) and is being advocated. The work done at erstwhile IPI, now constituent college at Indore on organic agriculture caught the attention of other nations and advocated the importance of residue recycling/use of organics in agriculture. However, the organic agriculture should have earmarked niche and pockets considering the export advantage and profitability to farmers. This type of benefit is likely to accrue in case of crops covered under AEZs, and aromatic and medicinal crops. General consensus based on experimental findings suggests that for sustainable higher productivity of various crops integrated approach is a better option. Soil test based models for nutrient management in soybean-wheat system worked out

suggests fertilizer economy with concomitant enhancement of productivity thereby increasing system profitability. The research on cropping systems performed revealed the benefits of crop diversification.



Soil testing and residue incorporation for soil health improvement.

Soil and water management research clearly signified the benefits of conservation techniques attempted in dry land agriculture, and constitutes a major bottle neck in sustaining crop productivity. Standardization of promotion of techniques/practices to conserve surface rain water will be receiving continued thrust in future to sustain crop productivity. The practice of conserving rain drop where it falls needs promotion. The State has sizable area under ravines in the Gird Zone, and problematic soils in central Madhya Pradesh and waste land in the State should receive attention to protect it from erosion and ways to use. General deterioration of soil quality/soil health is of major concern and is receiving attention of researchers. However, the issue needs focused attention. It is high time that the below ground microbial community be studied, its biodiversity is conserved and is utilized for improving soil quality and nutrient dynamics in the soil.

A proactive action is needed to conduct research on the productivity performance of crops with global climatic changes. Efforts are also to be made to work out strategy to sustain productivity with increasing green house gases and predicted increase in ambient temperature. In view of this changed cropping patterns and modified agronomic practices are to be identified.

Most of the rainfed crops are productivity loser on account of excessive growth of weeds. The crop-weed competition, particularly in *Kharif* crops, is known to cause enormous yield losses and needs special attention of researchers. Although, isolated approaches to manage weeds have been worked out, there is a need to offer a farmer with tested integrated package with use of herbicide is last option.

Under the ongoing All India Coordinated research projects in operation at different constituent colleges/set ups of RVSKVV, the improved production packages for respective crops have been worked out and recommended. However, there is a need to look for refinement with changed environment.

Crop protection

Integrated pest management has undisputedly proved vital not only for enhancing productivity, but also for curtailing pollution of environment and natural resources like soil and water. Several bio-agents and botanical products have shown their efficiency and eco-friendliness and needs promotion along with cultural management methods, thereby minimizing the use of agro-chemicals. The balance should tilt towards the promotion of natural predators and also microbial agents to manage pests and diseases.

Seed production

Quality seed is the most vital and critical input in crop production. RVSKVV organizes production of nucleus and breeder seed as per the allocation through its 26 farms (cultivated area 736 ha) located in different agro-climatic zones spread over 22 districts. The breeder seed of soybean, pigeonpea, mung, urid, groundnut, cowpea, paddy, sorghum and bajara in *Kharif* and of wheat, gram, maize, pea, lentil, safflower, mustard, and toria in *Rabi* is produced and made available for further multiplication in seed chain. In addition, seeds of hybrid varieties of crops (pigeon pea, maize, bajara, sorghum and castor in substantial quantities is produced. Planting material for guava, anola, citrus and pomgranate is also produced to cater the demand.

Farm mechanization

The increasing paucity and high wages of labour is posing problems for small farmers and do not permit them to do timely operations. Development and popularization of low cost machines like thresher for sunflower, safflower handling devices, water chestnut decorticator, pea peeling machine, chickpea stripping cum shelling machine, tillage equipment, energy saving

dryers and onion storage structure have been successful. More emphasis on development of farm equipments and devices supporting saving cost and time is to be given.

Transfer of technologies

Real fruit of technology developed can be harnessed only when it is transferred and adopted by the end-user. Despite concerted efforts to disseminate the improved production technology, the yield levels of most of the crops are lower than yield harvestable under real farm conditions. For effective transfer of technology with ever-changing clientele profile would require a paradigm shift. Henceforth, rather than emplacing on whole package, one will have to develop several packages suiting to the resourcefulness of the farmer. This needs meticulous clubbing of monetary and non-monetary technology in a prioritized manner. Moreover, use of electronic media (ICT) to be banked upon in future for transfer of technology with increasing computer awareness among farmers. Since the number of farm families in India is large and a good number of them are illiterate, it requires vigorous efforts jointly by all the players of production system. Public-private participation in transfer of technology can make a sea change in enhancing the productivity of crops. The agric product based industry is to be motivated to go for contractual farming with a group of farmers under a defined memorandum of understanding for sharing the benefits.

SWOT Analysis

Since its inception in the year 2008, the university has been growing with respect to the development of infrastructure, education, research and agricultural extension activities. A comparison of the present with the early days gives us great satisfaction in terms of its all-round development and in the dynamic world the university is trying to become well equipped to venture to take on the new responsibility of agricultural development in the State particularly in northern and western regions of the State. The analysis of strengths, weaknesses, opportunities and threats would help in placing agricultural education, research, and extension efforts in right perspective so that we succeed in our pursuit of doing the best. Therefore, an attempt is made to review and analyses our strengths, weaknesses and opportunities so that we may herald a faster growth in the next 25 years and beyond to fulfill the aspirations and expectations of the people of the State of Madhya Pradesh.

Strength:

Setting of this university at Gwalior with its jurisdiction area that is represented by different agro-climatic regions itself is an asset for the State of Madhya Pradesh.

- The constituent units comprising different colleges, Zonal Research Stations, Regional Research Stations and KVKs have good reputation as they have been bestowed with highly qualified staff / faculty members. They have contributed significantly for the benefit of the farming community of the State.
- Due to notable achievements made earlier by the Alumni, specifically that of colleges of Agriculture, Gwalior, Indore, Sehore, Khandwa and College of Horticulture, Mandsaur (now constituent units of RVSKVV), the university has distinguished advantage. Further, more this University has strong linkages with server ICAR international organizations and has also earned international reputation.
- The University has established a good reputation among national and international centres of agricultural education and research, as evidenced by various collaborative programs. Their strength, cooperation and support can be secured for further development of this University.
- With new research and extension responsibilities the university has greater scope to initiate and coordinate research projects with other SAUs / institutions of ICAR and secure greater integration for effective technology generation and dissemination.

- Each college and some zonal/ regional research stations have got some highly specialized, well-developed and fully equipped departments and also have experience of serving as Centre of Advanced Studies. These departments may further be upgraded as College / institute / school depending upon the need and scope of their development.
- The recently revised courses and curricula of undergraduate and post-graduate programs in different faculties and the dynamic approach for needful revision, as and when required, provides a solid background for all-round development of the students.
- The university has about 736 hectares of area for seed production which is a great asset in the service of farmers. However, to enhance the seed replacement rate, efforts are on the way to achieve the set target.

Weaknesses:

- As the university was established only in the year 2008, there is a lack of required infrastructure, etc with respect to university buildings and other infrastructure facilities. There is lack of central evaluation halls and offices, space for records related to finance and academics, etc.
- Lack of standard facilities for sports, equipment, play grounds, etc.
- Non availability of national and international guest houses, student hostels, and farmers (women and men) hostels.
- Lack of colleges for fisheries science, forestry, agricultural engineering, home science, management and food processing and technology.
- Non availability of university level facilities, such as ATIC, communication centre, auditorium, library, playground etc.
- Lack of modernized university instructional and seed production farms.
- Deficiency of technical and supporting staff in all the teaching and research programs.
- Lack of Experiential Learning facilities for students.
- Meagre efforts in basic and strategic research, essential for advancement of science.
- Research emphasis on socio-economic and policy aspects is inadequate.
- Lack of synergy/institutional linkages with line departments of the State and other universities.
- Lack of resources for diagnostic surveys in our research efforts.
- Non availability of sufficient funds for renovation and modernization of

colleges/labs/classrooms/libraries/playgrounds/hostels etc.

- No arrangement for substitution of old/unserviceable equipment.
- Lack of priorities and programs on disaster management, resulting in unsecured investments/profits in agriculture.
- The University scientists have succeeded in evolving technologies for higher production but in respect of quality improvement they are lagging behind. Similarly, to ensure nutrition security and sustainability in agricultural production very little has been done.
- Much needed research priority in the State of Madhya Pradesh on small and marginal farmers for rain-fed agriculture is not getting momentum.
- Wide variation in rainfall (500 – 1500 mm) in the State and its erratic distribution causes rainy season crops to suffer due to oxygen or moisture stress while most of the post rainy season crops suffer due to moisture stress. No research priorities to reduce kharif and rabi fallow areas.
- In black soil regions of Malwa and Nimar, low infiltration rate of soils due to high clay content (40 to 60% clay), poor internal and surface drainage, excessive runoff from sloppy lands, water logging on flat lands, high degree of plasticity and stickiness, swell shrink nature of soils associated with shrinkage cracks, high N and S losses, high P fixing capacity of soil and low fertility status are main problems.
- The light textured soils of northern parts of the State have low CEC, poor fertility status, low clay content and high infiltration rate.
- Poor organic carbon status coupled with low fertilizer consumption in dry lands/rain-fed areas in the State results in relatively poor response of crops to applied nutrients, instability in crop yields, less use of improved seeds and technologies and low cropping intensity.
- Deterioration of soil health and imbalance status of soil nutrients due to intensive farming.
- Increasing frequency of moisture deficit and prevalence of high temperature during reproductive growth of the crop.
- Occurrence of new diseases/insect pests and increasing intensity of prevalent biotic stresses in changing cropping scenario.
- Limited availability of early maturing HYVs having tolerance to abiotic stresses like drought, temperature, etc. and biotic stresses.
- Shortage of optimum region/agro-climatic zone specific IFS module for sustainable

livelihood security.

- Low seed replacement rate particularly in high volume low profit crops.
- Limited application of bio-technological tools and trained staff in managing the new agricultural problems.
- Lack of recommended technologies for cultivation of vegetables, spices, flowers, fruits etc.
- Genetic erosion of land races in vegetables and spices.
- Non-availability of proper markets for flowers, medicinal plants and other high value crops.

Opportunities:

- With the globalization of markets, there are ample opportunities for high demand of new products. There is a growing demand for highly trained manpower in specialized subjects.
- Increasing awareness of the hazards the Indian agriculture is likely to face in the next century on account of stagnation in yield, unabated growing pollution, continuous use of chemicals and pesticides with harmful residues, depleting resources and many other adversities.
- Since the RVSKVV, is a multi campi university and has colleges of agriculture/horticulture under different agro-climatic zones where different farming systems, social customs and farming communities prevail. The University provides exceptional opportunity to work in varying situations to determine solutions of agriculture related problems.
- Different regions in the jurisdiction of RVSKVV are rich in agri-biodiversity having many species of plants and animals not found elsewhere. This provides an ample opportunity for bio-diversity conservation in the State.
- The Information Communication Technology (ICT) in agriculture is another potential area which can be catered / disseminated effectively through computer and internet services and other means by different KVKs located in each district of the State.
- Nearly 50% of arable lands in the State of Madhya Pradesh are either degraded or on the verge of degradation with sizable area under waste lands which can be utilized for agriculture after its proper management.
- There is an opportunity to enhance the cropping intensity in irrigated as well as rain-fed areas (at present very low).
- What are opportunities in graduate, PG and Ph.D program, rational education, Distance education and why ?
- Due to globalization of agriculture new areas have emerged for production, processing and

services sector. The progress and growth demands for future research in these areas. There is tremendous scope for identifying AEZs and suitable commodity crops for export purpose which would add to the prosperity of the farming community in the State.

- The diversification of agriculture will provide plenty of opportunities to the scientists, farmers and industries to move towards prosperity and self-employment in the agriculture sector.
- New areas in the field of agriculture and allied sector are to be tackled through long-term research on NRM, biotechnology, energy management, marketing, processing related to crops, fruits, milk, egg, meat, fish, etc.
- There is every possibility for the transfer of improved package of practices to ultimate beneficiaries (socio agriculture entrepreneurship) in the State for obvious reasons.

Threats:

- Due to ever increasing population and growing urbanization, the agriculture in the State is likely to be adversely affected in coming years. More food has to be produced from shrinking cultivated areas, degraded lands and decreasing volume of irrigation water. The university scientists will face many challenges and constraints in solving newer farmer's problems.
- Farming no more profitable/ lucrative business. Farmer does not want his son to be a farmer. In general, average age of the farmers appears to be above 45 years. Supply of electricity and irrigation water is decreasing.
- With the increasing dominance of the industrial sector and a handful of influential industrialists, there is a continuous threat to agriculture being affected with effluents and pollutants which will prove hazardous to crops, trees, ground water, animals and human health.
- Scientists are likely to face many diversified and much more complex type of challenges in view of gradually increasing global warming/climate change effects.
- The university has limited resources and infrastructures at its outreach research stations in the State which are essential for conducting location specific research. Hence, new research Centres will have to be created which require sufficient funds and hard work. In the absence of the requisite facilities the scientists will have to work in cooperation with farmers for testing and verification of technologies developed by them.
- The development of difficult areas like ravines in northern parts of the State and Jhabua hills,

Nimar valley requires dedication and missionary spirit contrary to the existing environment and life style of the scientists and staff where every one wants to move towards urban / big city areas. As a result, the work suffers in different ways.

- For commercialization of agriculture in the State, huge investment and capital will be required which is beyond the reach of the farmers residing in rural areas. Unless and until the university resources are increased and utilized with commitment and devotion these objectives will be difficult to achieve.

Challenges and Issues

Challenges:

In general, some of the challenges, which deserve our serious attention, are as follows:

- New faculties/ infrastructure/human resource development to upgrade teaching, research and extension requirements
- Quality of education
- Job and business oriented education
- Organic farming, soil and plant health
- Natural resource management (recycling of wastes and waste water in agriculture, resource conservation technologies, etc.)
- Stagnant crop productivity
- System wise production technology
- Diversification of agriculture to enhance farm income
- Plant improvement
- Post harvest processing and value addition
- Use of bio-technology and nano-technology in agriculture
- Sustainability of agricultural production.
- Use of GIS and remote sensing in agriculture
- Bio-fuels
- Climate change/global warming
- Biotic and abiotic stresses
- Farm mechanization and development of equipment
- Quality improvement and standardization of farm produce in conformity with international standards
- Maintenance of dynamic relationship between agriculture and environment
- Terms of trade in agriculture; reducing cost of cultivation plus enhancing fertility plus value addition to ensure farm prosperity
- Rural livelihood security and making agriculture a profitable business

Issues:**(1). Education related:**

- (a) Infrastructure development for students related activities
- (b) Increase in number and value of scholarships/fellowships for UG/PG students
- (c) Establishment of experiential learning units in all constituent colleges of the university
- (d) Establishment of niche area of excellence and centre of excellence for promoting academic excellence in critical or emerging new areas at PG and Ph.D level.
- (e) Improvement in employment/placement opportunities to agriculture stream students.
- (f) Creation of more incentives, awards and prizes for talented students / faculty members of the university.
- (g) Enhancing employment opportunities in agriculture by further modifying the course curriculum in global perspective.
- (h) The university should play a role as dynamic promoter of changes in agricultural research and education.
- (i) Infrastructure development for quality education
- (j) Knowledge backup for protection of natural resources and climate changes
- (k) Encouraging investment from private sector in higher agricultural education and research
- (l) Requirement of agricultural graduates, post-graduates and Ph.D and their specialization as per need.
- (m) Agricultural Technology parks for empowering students and farmers to link production and post harvest processing along with marketing.
- (n) Increased role of private sector in imparting agricultural education.
- (o) Linking of the University with educational institutions and research organization in India and abroad.
- (p) Setting up vocational training centres as per need of farmer and the industry.
- (q) Increased budgetary support from Govt. of M.P. and GOI. (ICAR).
- (r) Starting new colleges in the field of agriculture ad allied sector considering the demand/requirement, specifically in less developed districts.
- (s) Strengthening and modernization of existing constituent colleges of the university.

(2). Research related:

Though all the research and developmental organizations of the region are making sincere efforts, still many of the issues remained unresolved. Some of the major issues which need to be addressed in long term are as under:

- (a) Food security
- (b) Sustainability of agricultural production
- (c) Low productivity and unstable yield in rain-fed areas
- (d) Climate change and global warming
- (e) Ecological balance and environmental insecurity
- (f) Rapid loss of agro-biodiversity
- (g) Shifting of agriculture to marginal lands due to urbanization and industrialization
- (h) Dwindling investment in agricultural research and technology development
- (i) Promotion of private sector funding in basic and strategic research.
- (j) Poor linkages
- (k) Farmer's distress and shift in poverty mix and food basket due to decreasing size of land
- (l) Long term policy of research for sustainable agriculture
- (m) Agricultural trade, marketing and globalization

Some of the important researchable issues of the region, which deserve immediate attention, are as given below:

- Chickpea: Lack of availability of good quality seed of high yielding varieties.
- Soybean: Occurrence of occasional epidemics of pest and diseases.
- Oil seeds: Severe alternaria and necrosis disease in sunflower. White rust, alternaria blight and pests like aphid and painted bug in mustard and aphids in safflower. Poor crop establishment and plant stand in sesame and niger.
- Cotton: Drought with scanty and uneven rainfall during the grand crop growth period, cultivation in shallow soils with low moisture retention capacity
- Sugarcane: Low adoption of improved production technology, early shoot borer in drought affected areas.
- Fruits: Spongy tissue and fruit fly in mango, seed borer in sapota, and tea mosquito in cashew are major problems. There is lack of available varieties suitable for processing and export.

- Weeds: *Parthenium hysterophorus* in cropped and non-cropped areas. Increased infestation of invasive weed (*Chromolaena odorata*) in the plantation crops, forestry, grasslands. Weed problem, specifically in kharif crops.
- Mechanization: Small size of farm holdings, high cost of farm machinery, and inadequate finance for farm mechanization, devising small and cost effective power operated implements which can be afforded by small and marginal farmers and good for cane and potato cultivation in heavy soils, etc.
- Livestock: Up gradation of nondescript and low productive livestock population, short supply of sufficient number of breedable bulls, trained manpower.
- Fisheries: Lack of awareness about fish culture, non availability of quality seed material, providing processing, storage, transport, and value added hygienic fish marketing, formulation of cheap and quality fish feed.
- Inadequate supply, non-availability of good quality seeds and planting material.
- Dependency on rainfall and frequent crop failures.
- Increasing the double cropped area in rain-fed areas.
- Low yields due to poor crop management in irrigated areas.
- Weak extension link and improper plant protection.
- NRN: Large area under ravinous lands and salt effected soils, large area fallow kharif and rabi seasons, less availability and poor quality of irrigations water etc.
- Inadequate supply of irrigation water, shortage of water during summer, excess of water and spoilage of land resulting in water logged conditions in canal areas.
- Inadequate supply of organic matter resulting in deterioration in soil health.
- Lack of availability of inputs and credit facilities, inadequate communication
- Imbalanced fertilizer use and spurious fertilizers
- Standardization of parameters and techniques for export oriented vegetables are needed.
- Package of practices and processing for medicinal and aromatic plants needs to be developed.
- Well equipped processing units, markets, transportation facilities, and skilled manpower to handle horticulture produce are lacking.

(3). Extension related:

- (a) Developing Krishi Vigyan Kendras as knowledge resource centres.
- (b) Assessment, application, refinement and feedback for the researchers.
- (c) “On Farm Testing” identifying technologies in terms of location specific.
- (d) “Front Line Demonstration” on various technologies which have been tested in OFT or proven already.
- (e) Low yields due to poor crop management in irrigated areas.
- (f) Weak extension link and improper plant protection
- (g) Creation and strengthening Training Academy, Farmers’ hostels, etc.
- (h) Mobile soil and plant clinic vans equipped with latest equipment and analytical facilities for on spot advisory services (diagnosis and treatments) at each KVK.
- (i) Market demand driven extension activities to make farming a profitable business.
- (j) Creation of specialized centres for training and demonstration for various technologies/ entrepreneurship at different KVKs.
- (k) Establishment of agro-technological information centre (ATIC).
- (l) Agro-technological parks.
- (m) Entrepreneurship development and vocational training.
- (n) Post harvest Processing and value addition parks.
- (o) Empowering farm women.
- (p) Lack of co-ordination and collaboration among different change agencies Slow rate of transfer of technology.
- (q) Non adoption of recommended varieties and package of practices

Strategy and Framework

The ever-increasing requirement of food, feed, fuel and fibre with burgeoning population has exerted a tremendous pressure on land and water resource, plant, animal and micro-organisms biodiversity. It has become imperative to enhance the productivity of crops and sustain it on shrinking land and water resources with utmost care for maintaining quality of natural resources without harming the environment. The attention is not only needed to enhance the productivity and quality of crop produce or value addition to it, but also on preservation of rights on natural and created biodiversity, export avenues, and turning out to be globally competitive to enable export of commodities produced / processed / value added. So it becomes joint responsibility of policy makers, researchers and farmers. Every one of them will have to be proactive and system needs to be in place. The Convention on Biological Diversity (CBD) in 1993, and The Geographical Indication of Goods (Registration and Protection) Act, 1999 has provided safeguard to us, however, creation of awareness and proactive individuals should play positive role.

To take the Indian agriculture ahead, effort are necessary for rapid spread of needful technology and thoughtful continuous research. To meet the requirement, there has to be efficient and educated manpower, which can only come out from agricultural universities. This is feasible only when the task is accomplished by knowledgeable teachers. Hence, the seats of human resource developments like agricultural universities are to be strengthened adequately. RVSKVV, which came into being in 2008, is still in infancy and needs strengthening with respect of infrastructure, staff, teaching aids and advance equipment and other research facilities, farm mechanization and other aspects. It is also proposed to expand teaching sphere from awarding graduate and post graduate degrees to run diploma courses so that qualified technical staff in agriculture sector may be made available.

Following strategies are proposed to be adopted to accomplish the vision and goals:

- **Education Development**

- Improve efficiency of infrastructure and financial reviews
- Considerable strengthening by establishing various offices at University head quarter including university campus buildings, research farm and instructional farms, etc. University campus plan has to be completed in phased manner. Master plan already approved.

- Renovation of old buildings, college campus including laboratories, farm, boundary walls / fencing, etc. Efforts for funds from Govt. of MP and ICAR will be helpful
- New laboratories in different departments, constructions / modernization of seminar rooms and classrooms, play grounds, roads, auditorium, gymnasium, sports equipments, etc at different constituent colleges
- Prioritize demand-driven and resource based education program with focus and emerging market opportunities
- Harness synergies of all the stakeholders in developing improved technologies knowledge and informations
- Develop and pilot effective delivery system and evolve institutional models to link education, research and development system with farmers and other stakeholders in the value chain for accelerated adoption, value addition and processing through efficient marketing, information and communication technology and e-education
- An increase in educational seats at 5% (as per State government norms) is expected. To accommodate these students and for creating facilities in tribal regions, opening of new colleges in a phased manner will be necessary. Five Agricultural Colleges, College of Processing and Technology, College of Agri-Engineering and Technology, College of Agri-business Management Studies, Centre for Rainfed Farming, Centre for Seed Technology and Centre for Advanced Studies, Niche Area of Excellence, etc. need to be established.
- New Krishi Vigyan Kendras at tehsil level, establishment of ATIC are proposed to strengthening of extension program
- Use of e-media for teaching and learning will be strengthened.
- Equipment/facilities for modernization of farms.

- **Human Resource Development**

- Appointment of adequate and qualified staff (all categories) as per norms for deficit staff in existing system and newly proposed establishment for quality education, research and extension.
- Starting new Departments/Colleges/Centres for specialized skill development as per demand in market such as Master degree in Agri. Business Management, Diploma/ Degree in organic farming, Degree program in Post Harvest Processing /Food Technology, Agri Engg., Vocational education in seed production, Horticulture nursery and others as per need.
- Training of foreign students for Degree/ Diploma programs.
- Collaboration with National/ International institutions for education.
- Setting up facilities for academic excellence in critical areas.
- Provision in Act of SAUs for PPP/ private college of agriculture, horticulture, agri. engineering etc. and development of guidelines for execution considering the demand of trained students.
- Development of guidelines and setting up facilities for collaboration with agro-industries.
- More emphasis on faculty up-gradation and development in new areas through exposure visits / training in State of art laboratories / organizations / institution in the country and abroad under bilateral programs of State / Central Government, participation / conduct of summer / winter courses for effective implementation of new / revised curricula / new subjects like nano technology, bio diversity, etc.

- **Harnessing the Potentials of Genetic Resources**

- Molecular and conventional breeding for high yield, early maturity, resistance to biotic and abiotic stresses, quality food grade characters, and other specialty character to develop improved varieties of crops.
- Collection, evaluation, characterization, documentation and conservation of species diversity and their utilization for improvement in seed yield
- Production of nucleus and breeder seed for further multiplication in seed chain to produce certified seed

- Conservation of biodiversity of medicinal and aromatic plants
 - Standardization and development of appropriate root stalks of mango/citrus/guava /pomegranate , etc for better adopted root system and high density orchards
 - Crop improvement and rapid propagation techniques for horticultural crops
 - Development of export quality roses /bulbous plants and other flowers
- **Crop Production and Protection**
 - Strengthening of research on conservation agriculture to protect soil, water and environmental pollution
 - Standardization of crop production utilization integrated approach (IPNS/IWM/IPM for changing/emerging cropping systems
 - Use of nano-technology in plant nutrition and pest management for enhancing effectiveness and reducing the input quantity
 - Standardization and promotion of integrated farming approach for better livelihood security
 - Study and utilization of underground microbial community in integrated crop management
 - Standardization of techniques for organic production
 - Development of technique for soil quality management
 - Standardization of production and protection techniques for grape and other dry land fruits
 - Identification of production techniques for medicinal and aromatic plants
 - Fodder production and conservation techniques
 - Working out models on forecasting of pest/disease incidence
 - Molecular identification of races/ variants of major diseases and pests of crops and standardization of IPM techniques
 - Studies on host plant resistance- mechanism and sources
 - Testing of botanicals and bio-agents for management of pests and diseases and use of indigenous technical knowledge in their combination
 - Development and use of advance technology for weather forecasting
 - Research on climate resilient agriculture

- **Value addition and Marketing**

- Establishment of production units for bee keeping, vermicomposting, bio-fertilizers and bio-agents with standardization of techniques for maximisation of production
- High-tech horticulture
- Quality seed and seedling production of vegetables and spices
- Development of pre and post harvest technologies for value addition
- Standardization and promotion of low cost poultry and animal feed
- Standardization and promotion of collective marketing and linkage strengthening
- Setting up infrastructure/ facilities for training on marketing related issues
- Export promotion

- **Natural Resources Management**

- Strengthening research on Water-Management including micro-irrigation and establishing sub centres in all the zones
- Strengthening research on soil health management including reclamation of saline and alkaline soils, establishing sub station/ centres in different zones
- Development of technology for use of ravinous areas.
- Strengthening research on dry land agriculture.
- Studies on climate change and establishment of automatic weather station to facilitate appropriate analysis of weather parameters.
- Research on watershed management to make the system economically viable at micro-level
- Studies on ground water storage/recharge
- Research on soil-water-plant and nutrient relationship

Annexure 1: Strategic Framework

Goal	Approach	Performance measure
University campus development – administrative block, auditorium & symposium halls including dining halls, PG block, site development, provision for amenities (banks, post office, dispensary, etc.), central library, computer centre and communication centre	Work to be initiated in XII plan and be completed in next 5 to 10 years in a phased manner, as per availability of funds. Time schedule and monitoring of construction work will strictly be followed	Availability and functioning of respective offices
Construction of ATIC (agriculture technology information centre), scientists hostel, farmers hostel and international guest house.	Work to be initiated during XII plan and to be completed in a phased manner, by proper monitoring and within time-frame	Availability and functioning of respective offices in buildings
Modernisation of library (e-library), modernisation of class rooms / laboratories equipping them with audio-visual teaching aids at each constituent college/unit	Work to be accomplished in a phased manner by proper monitoring and within time-frame.	Availability of desired infrastructures with proposed facilities and their utilization
Construction of central evaluation offices and examination halls, facilitating colleges with latest farm implements/machines, crop cafeteria, addition of new laboratories for UG, PG and PhD courses and extension and renovation of guest houses at each college	Work to be initiated in XII plan and to be completed in next 10 years in phased manner, by proper monitoring and within time-frame	Availability of desired infrastructures with proposed facilities and their utilization
Strengthening of existing research centres both in terms of staff and infrastructure, and establishing new special/critical area of research	Work to be initiated in XII plan and to be completed in phased manner, by proper monitoring and within time-frame.	Formation of technical program fulfilling the research needs of the farming community
Modernization of farms in terms of staff, equipment, machinery and tools godowns, seed processing plants, fencing, boundary wall,	Work to be started during XII plan and to be performed in phased manner, by proper	Making agriculture farms available for education extension and research

irrigation, road and electricity facilities for achieving better and quality production, targets of processing and value addition	monitoring and within time-frame.	
Creation of indoor and outdoor sports facilities, gymnasium with standard equipment	Work to be initiated in XII plan and to be completed in phased manner by proper monitoring and within time-frame.	Availability of desired infrastructures with proposed facilities and their utilization
Creation of facilities of auditorium, conduction of seminars, lectures, symposium, and work shop regularly in each constituent college	Work plan to be prepared in a phased manner. Participation of students, scientist, professors, and other stake holder exchange of views and formulation of strategic policies by proper monitoring and within time-frame.	Availability of desired infrastructures with proposed facilities and their utilization
Addition of hostels for boys and girls at each of the five colleges and new colleges as per growing need	Work to be initiated in XII plan and completed in a phased manner by proper monitoring and within time-frame.	Availability of desired infrastructures with proposed facilities and their utilization
Creation of new agriculture colleges, agricultural engineering college, college of home science, food processing and technology institute, agriculture science academy and vocational education centre and management in institute etc. as per future need	Work to be initiated during XII plan onwards whenever grant is made available, work to be performed & completed in a phased manner, by proper monitoring and within time-frame.	Functioning of new colleges
Opening of new departments (Food science and technology, biotechnology, forestry, agri-journalism), new courses including diploma courses	To be done in phased manner after developing and timely execution of plan	Functionality of new departments
Opening of new UG and PG programs and diploma in business administration in agriculture,	Work to be initiated during XII plan onwards whenever grant is made available,	Functionality of diploma courses

bachelor of agri.buisness adminstration, MBA in agriculture	work to be performed & completed in a phased manner by proper monitoring and within time- frame.	
Creation of (i) research centre for water technology, (ii) research centre for medicinal and aromatic plants, (iii) seed technology and processing unit, (iv) gene bank and cold storage facility (v) bio-technology centre (vi) ravines / wasteland management centre, soil health management, centre for HRD, countinuous education centre, etc.	Work to be initiated during XII plan period and completed in a phased manner, by proper monitoring and within time- frame.	Creation and utilization of facility
Appointment of adequate and qualified staff (all categories) as per norms for newly proposed establishments as above and of deficit staff for strengthening existing establishments	A continuous process in the direction of HRD and improving education. To be accomplished starting from deficit staff, particularly in teaching	Improved image of the organisation by performance of students in different fields
Strengthening linkages and collaborations with other organizations of repute in India and abroad in the field of education, research and extension	Efforts to work out formal and informal level by the university authorities and senior officials	Visibility on account of exchange of information, knowledge sharing and utilization of complementary facilities and manpower in research and education
Creation of facilities for research on climate change / global warming , integrated farming systems	Long term efforts have to be made with respect to climate and time	Coordination with all stake holders, exchange of information, knowledge and utilization of complementary facilities and manpower in research and education
Molecular and conventional	Breeding of varieties using	Enhancement in

breeding for high yield, early maturity, resistance to biotic and abiotic stresses, quality food grade characters, and other speciality character to develop improved varieties of crops	conventional and molecular tools to introgression desired traits in improved varieties	productivity and utilization of crop varieties for value addition
Production of nucleus and breeder seed	Maintaining desired purity of seed to be used for further multiplication	Enhancement in seed replacement rate culminating in improved productivity
Conservation of biodiversity of various crop plants of agricultural importance as per need.	The material can be used to produce better varieties of crops	Better yield and adoption of these crops, quality ingredients etc.
Standardization and development of appropriate root stalks of mango/citrus/guava /pomegranate , etc for better adopted root system and high density orchards	To improve and promote quality fruit production	Availability of quality fruits for domestic consumption, export and further processing and value addition
Development of export quality roses /bulbous plants and other flowers	Attempt to meet the quality standard necessary for export	Increase export of cut flowers and planting material and availability of produce for value addition
Use of nano technology in plant nutrition and pest management for enhancing effectiveness and reducing the input cost and quantity	To utilize effectiveness and targeted use of nano encapsulated active ingredients in crop management	Reduced cost, more effectiveness and minimized environmental hazards
Management of soil resources including management of waste land, <i>i.e.</i> , ravines, salt affected and other degraded soils	To be initiated immediately, ensuing execution as continuous progress and which is to be accomplished as soon as possible	Concerted working with government institutions and farming community
Use of biotechnological tools in	To be a accomplished as a	Coordination with international/central

agriculture	continuous process	bio-technology laboratories
Study and utilization of underground microbial community in integrated crop management	To isolate effective microbes and utilize them in integrated crop management and to document microbial diversity	Effective crop management, reduced chemical input and cleaner environment
Standardization of techniques for organic farming	Involving botanicals and bio-agents for IPNS and IPM and to target export of produce, value added product and promote crop residue recycling and organic manure use	Minimized use of agrochemicals/pesticides, cleaner environment, improvement in soil quality
Molecular identification of races/ variants of major diseases and pests of crops and standardization of IPM techniques	Utilization of knowledge in better management and rational use of pesticides	Targeted and effective management of pests and diseases in eco-friendly manner
Testing of botanicals and bioagents for management of pests and diseases and use of indigenous technical knowledge	Use of natural products to take the advantage of naturally occurring predators and pathogens for pest management	Indigenously processed/multiplied natural botanicals and bioagents and use of ITK for cleaner environment and at lower cost enhancing cost competitiveness
Working out models on weather forecasting	To utilize generated data on climatic parameters and relate with pest/disease incidence to work our forecasting models	Pre warning to farmers on possible incidence of pest and diseases
Setting up facilities for value addition to crop produce, horticulture crops, post harvest technology, quality seed production, processing of crop residue and animal waste for recycling	To enhance the value of produce, quality of planting material and soil quality restoration	Higher income, better soil quality and cleaner environment

Secondary agriculture requirement trained and skilled workers in agriculture	To conduct certificate course for entrepreneurship development as a continuous process	Job oriented farmer with entrepreneurship skills to perform agricultural field work
Market analysis and intelligence gathering	To keep updated on agric-market trends to take advantage in profit making	More profit on disposal of produce when prices are higher
Strengthening of Krishi Vigyan Kendra for centre of excellence for different programs (specialized centre), and entrepreneurship development	Work to be initiated during XII plan onwards whenever grant is made available, work to be performed & completed in a phased manner. Strict monitoring of progress of work	Training of staff, students, farmers and other stake holders at KVK centres of excellence.
Use of ICT in transfer of research emanated production technology	To use all the extension methods including that of ICT for dissemination of information	Enhanced productivity, appropriate use of agrochemicals and improved income of farmers