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RESEARCH PAPER

Assessment and strategies for improving quality of agricultural education : A case study in Karnataka

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Abstract: Education is having both intrinsic and instrumental value and provides useful services for the development of nation and enrichment of an individual's life. The quality of agriculture education is the key for solving multifaceted problems of agriculture and allied sectors. The assessment of existing human resources, the sectoral growth, capacity utilisation of qualified graduates is indispensable to envisage the future agricultural education needs. Also, it is imperative to assess the future human resource needs in consonance with the targeted growth rates of the various sub-sectors of agriculture. The study was conducted in Karnataka during 2016-17 with the objectives of to suggest measures and strategies for the development of skilled human resources in agricultural sector. The study used both primary and secondary data and was collected from various stakeholders in Karnataka. The findings of the study were: i). Agriculture is undergoing rapid transformation with the advent of new technologies, commercialisation and globalisation and emergence of issues relating to climate and environment. Teachers have to keep pace with these developments and the resulting need to acquire new knowledge. While some organisations are imparting training in the emerging areas, there is no specific training policy for up-gradation of the skills of teachers. Therefore a plan of action has to be evolved so as to cover all the teachers under capacity development programme in a specific period of time. Need to create the teacher training units in the state similar that of HAU, Haryana and NAARM. ii).There is need for creating and maintenance of centralised database of all education, research and extension activities at University level. This database would help for identification and prioritization of research, education and extension activities at university level, state and national level. Data Analytical Cell (Data Science) needs to be established conduct research on farmers and other stakeholders problems in addition to support for education planning. Adequate institutional funding and infrastructure and effective management are some of the areas that directly made an impact on quality of education. Focus should be made towards upgradation and increase the infrastructure facilities existing and new colleges.

Key Words: Agriculture, Education, Human resource, Quality

Introduction

Education is having both intrinsic and instrumental value and provides useful services for the development of nation and enrichment of an individual's life. The human development paradigm recognises the role of education in the expansion of choices for wellbeing, security and comfort. Therefore, the right to education is recognized as one of the fundamental human rights and, the drive towards universal elementary education aims at ensuring its delivery. The impressive development of education is termed as education explosion. But unfortunately the quantitative change has not been accompanied by conceptual and qualitative changes of comparable scale and depth, appropriate to the new situations, requirements and needs (UNESCO, 1998). Thus changes in the field of education have become indispensable for the better. Education should nurture the all-round development of an individual's personality, and thus make them an active member of knowledge society and a productive citizen of the country.

Agricultural Education in Karnataka

Soon after independence, India followed the path of science, which led to the growth of agriculture reaping rich dividends. National Agricultural Research System (NARS), consisting of ICAR Institutes and State Agricultural Universities, has played a pivotal role in the accomplishment in the field of agriculture. The green revolution, with its impressive social and economic impact, would not have been possible without the availability of technically qualified human resource. Thus, agricultural education is placed in the forefront for building a scientific manpower base. Similarly, in Karnataka first Agriculture University was established during May 25, 1963 at Bangaluru with two colleges in Bangalore and Dharwad. Later University of Agricultural Sciences Dharwad was come into existence during October 1, 1986. After words one more Agriculture University as UAS, Raichur was established in the year 2009 with four colleges. University of Agricultural and Horticultural Sciences, Shimoga was established in September 21, 2012 with five (Agricultural and Horticultural) colleges. Totally six farm Universities in the state including one Karnataka Veterinary and Animal husbandry & Fisheries Sciences University.

The quality of agriculture education is the key for solving multifaceted problems agriculture and allied sectors. The assessment of existing human resources, the sectoral growth, capacity utilisation of qualified graduates is indispensable to envisage the future agricultural education needs. Trained human resources are needed in different sectors of agriculture for targeted growth. The sectors are to be serviced by human resources with higher skills than before to ensure technology generation, its transfer to and more importantly its application at the grass root level. Further, agricultural human resources with diverse skills is today required by a wide- ranging and fast expanding food processing industry, corporate and unorganized sector.

At present there is a mismatch in requirements of industry/ organisations and outturn of agricultural graduates with required skills. Present study was conducted to address the developmental needs of the economy with special reference to education in agriculture and its allied sectors which have an important place in the state economy due to their role and potential in providing employment to skilled, semi skilled as well as unskilled persons. Skill needs are changing and hence a need for analyzing the skill gaps, the institutional mechanism in imparting education and assess the future requirements of the sector in the context of human resources.

The objectives of the study are

- To assess the quality of human resources in agriculture and allied sectors.
- To suggest measures and strategies for the development of skilled human resources in agriculture and allied sectors.

Methodology

The data collected included both primary and secondary. In order to assess the quality of education, stakeholder survey has been conducted with a targeted respondents such as students, Teachers, agricultural working graduates, establishments, institutions and organizations.

Sample Design:

Primary data: The data were collected through pre tested questionnaires from various stakeholders of the study includes students, teachers, Alumni, Agro-based industries, Organization/ institutions

To find out the skill gap and quality of agricultural education, 245 students who study in the field of agriculture and related sciences have been interviewed through structured questionnaires. These students include (184-UG, 40-PG and 21-Ph.D) from different colleges in all the farm universities of the state. The individual educational experts have been covered from State Agricultural Universities, government departments as well as other establishments in public and private sectors. 50 experts/teachers functioning in various disciplines like Agriculture, Horticulture, Veterinary, Agril. Engineering, Agril.Marketing, Bio-Technology, Dairy Technology, Fishery, Forestry, Rural Home Science and Sericulture have been covered (Table 1).

Secondary data: Information from the university Placement Cell were collected, in order to know the trends in employability of graduates for last five years, growth rate of different sub sectors *viz*., financial institutions, NGO's, private seed, fertilizer & pesticide companies was calculated to estimate the requirement of man power. The present status of sanction, filled and vacant posts at university level cadre wise Assist Professors, Associate Professors and Professors in different sectors. Annual reports of past five years (2010-2015) were also collected from all the SAU's. The sanction, filled and vacant posts in the concerned state departments such as Agriculture, Horticulture, Sericulture, Animal Husbandry and Veterinary, Fisheries, Forestry, Watershed and Women and Child Development Department were obtained by personal interview with officials and annual reports.

Data and information on financial Institutions were collected from nationalized bank information on number of agriculture and allied sector graduates working in the institution was collected by personal interview with the official from state headquarter and also data from Reserve Bank of India (RBI) website. Similarly, information from five private banks was collected. With regard to Agro-based industries, the HR office of the agro-based industries contacted, available data and information on total number of graduates recruited in private companies/industries such as, seed, fertilizer, pesticide companies, equipment dealers, manufacturers of equipments, seed production, nursery, sugar factories, food processing industries were collected.

Table 1. Sample design of the study

Particulars	Sample Size
Students	245
Teachers	50
Alumni	30
Organization/Institutions/Agro-based industries	30
Total	355

Analytical tools

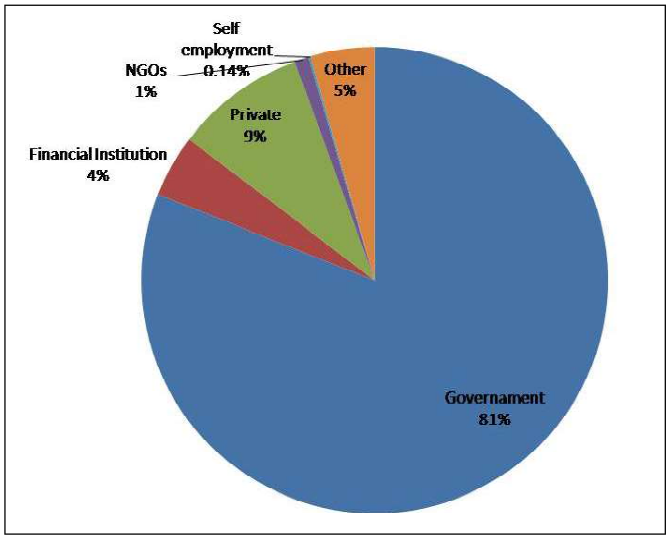
Compound Annual Growth Rate(CAGR), descriptive statistics and percentages were used for analysis of data and draw a meaningful conclusion.

Results and discussion

Pattern of Employment Opportunities for Agriculture and Allied sectors

A number of sub sectors of agriculture requires well qualified human resources to attain maximum growth of the agriculture sector. The skilled human resources in agriculture are mainly required in research and education and extension of suitable technologies to the farmers. Distribution and sale of inputs like seeds, fertilizers, farm equipment and pesticides, production of crops, agricultural credit and crop insurance services, pricing and marketing, post-harvest storage, quality control, and processing and wholesale and retail sales to the consumer. Agri-businesses, agri-clinics, agro-service centres and other modes of self-employment also have a large potential to employ human resources in agriculture science (Table 2). Agriculture Biotechnology graduates were very much needed in tissue culture lab, veterinary pharmaceutical sector, academic sector, NGOs, in SAU's- Teaching , Research, Extension, seed companies, and other public institutions.

The deployment of agricultural human resources during 2014-15 is depicted Fig.1 (all disciplines put together) The shares of various segments by employment are: 81 per cent in government, 9.04 per cent in private, 4.37 per cent in financial, 1.00 NGO's, 0.14 per cent self employment and 4.45 per cent in others sectors. The major shift will be takes place in the coming decades (2024-25) is may be due to decline in the share of public sector in employment, and also due to freezing



employment in government sector as well expansion of opportunities in the private sector. This is in tune with the emergence of commercialisation as well as diversification.

Trends and pattern of employment through Placement Cells

The financial institutions such as nationalized and private banks are major employers for agriculture graduates through placement cells. Presently, agriculture graduates are recruiting through banking exam conducted by Institution of Banking and personal selection (IBPS). Whereas, private banks by direct interviews. Financial institution is currently growing at 5.0 per cent and this trend is likely to continue. By looking into past five years of data obtained from placement cells all the SAU's the employment pattern of graduates in the financial institutions revealed that the growth rate (CAGR) is about 5.60 % from 2010 to 2015. The details of recruitments through placement cell are given in Table 3.

Assessment of Quality of Agril. Education

In order to knowing the gap in quality of agriculture education, interviews with pre-tested questionnaire and focus group discussions were held with sample agricultural establishments, Organizations, Institutions, Agro-based industries, Teachers, Alumni and Students.

In the interviews, the students were asked their opinion regarding the quality of their Course Curriculum. Since the outcome is, naturally, strongly dependent on degree programme, and sectors, a generalized answer can't be given. They were also asked about suggestions what the changes make are in the agriculture education system to make improvement in the education. Few of the student comments that the content of

Table 2. Employment Opportunities for Agriculture and Allied sectors

Sl .No.	Sectors	Opportunities in public and private sectors Agriculture Dept. (40%) and other public
1	Agriculture	Dept.-Co-operative Dept., RDPR, KSRTC, Administrative posts (10%) and R&D and Education (5%), Financial institutions (20 %), seed industry (5%), fertilizer industry (5%), farm equipment (2%) and pesticide industry (5%), self-employment (0.5%), NGOs (5%) and others (2.5%).
2	Agril. Engineering	Agriculture Dept. (4%) and other public Depts.-RDPR, KSRTC, Administrative posts (5%) and R&D and Education (5%), Tractor companies (40%), Financial institutions (5 %), farm equipment and processing industry (20%), self-employment (2%), NGOs (5%) and others (5%).
3	Agril. Marketing	Agriculture Marketing & Co-op dept. (20%) and other public dept.-RDPR, Administrative posts (10%) and SAU's (5%), Financial institutions (20%), agriculture input sector (30%), self-employment (0.5%), NGOs (4%) and others (10.5%).
4	Agril. Bio-Technology	Tissue culture lab (30%), Veterinary Pharmaceutical Sector (20%), Academic Sector (5%), NGOs (5%), Teaching (3%), Research (5%), Extension (1%), Public institutions (2%), seed companies (8%), and others (21%).
5	Rural Home Science	Developmental Departments (40%), SAUs (8%), Food Processing Industries (15%), Hospitals (2%), Self Employment (2%), NGOs (5%), Financial Institutions & Insurance companies (7%) and Others (29%).
6	Food Technology	Developmental Departments (2%), SAUs (5%), Food Processing Industries (35%), Self Employment (2%), NGOs (15%), Financial Institutions (5%) and Others (36%).
7	Horticulture	Horticulture Departments (40%), SAU's-Education, Research and Extension (10%), Seeds/saplings-nurseries/seed farms (20%), Agro Chemical Industries (10%), Financial institutions (3%), Post-harvest- quality control, transport, cold storage (10%), NGOs (2%) and others (5).
8	Veterinary	Veterinary Dept. (40%), R&D (7%) and Education (5%), Public Veterinary Services (5%), Private Veterinary Services (15%), Financial institutions (2%), Vet. Pharmaceutical and animal drugs (10%), Animal feed industries (2%), Milk and Meat Processing Industries (5%), Self Employment (2%), NGOs (2%) and others (5%).
9	Dairy Technology	Veterinary Departments (15%), SAU's (10%), KMF& Co-operative societies(10%), milk and milk processing industries (25%), Self Employment (2%), NGOs (10%) and others (28%).
10	Fishery	State Fisheries Department (45%), SAU's (5%), Financial Institutions (5%), Processing plants (5%), Fish/Shrimp seed hatcheries (5%), Shrimp/Fish rearing units (5%), Feed mills (5%), Canning industries (2%), aquaculture farms (4%), aqua-feed plants (5%), deep sea fishing vessels (1%), and pharmaceutical companies (2%), NGOs (7%), Self Employment (2%) and Other (2%).
11	Forestry	Forestry Department (60%), SAU's (8%), Administrative posts (5%), Financial Institutions (1%), Agro Processing-Timber & Wood Industry (10%), NGOs (2%), Self Employment (0.5%) and Other (13.5%).
12	Sericulture	Sericulture Department (50%), Silk Board (5%), SAU's (8%), Sericulture Processing Industry (10%), Financial Institutions (4%), NGO's (10%), Self Employment (3%) and Other (10%).

Source: Annual reports & Focus Group Discussions with Experts

Table 3. Employment through University Placement Cells

Organizations	2011	2012	2013	2014	2015	CAGR (%)
Agriculture (includes Agri. Marketing, Agri. Engineering, Agri. Biotech, Home Sci., Food Tech.,)						
Financial Institutions	52	17	31	39	45	5.6
Seed Industry	10	17	13	26	32	31.7
Fertilizer Industry	24	15	16	33	46	23.2
Pesticide Industry	14	17	22	28	35	26.3
Farm Machineries	12	16	27	28	33	29.5
NGO's	4	12	9	9	15	26.6
Others	12	17	15	18	22	13.5
Total	128	111	133	181	228	17.9
Horticulture						
Financial Institutions	2	1	3	1	3	8.4
Seeds Industry	4	3	5	6	6	16.2
Fertilizers & Pesticides Industry	2	1	3	3	2	11.6
Processing and Marketing	3	2	4	2	7	18.5
Total	11	7	15	12	18	16.5
Veterinary						
Vet. Pharmaceuticals	3	3	9	9	7	32.2
Poultry Industry	3	5	5	7	9	28.8
NGO's	2	2	3	3	6	29.7
Others	3	2	4	4	5	18.7
Total	11	12	21	23	27	27.7
Fisheries						
Hatcheries	2	2	5	2	8	32.0
Fish Processing	2	4	5	2	7	19.9
Feed Industry	1	1	1	1	3	24.6
NGO's	1	3	1	5	2	20.9
Others	1	1	1	3	2	28.2
Total	7	11	13	13	22	27.9

the study should be adapted to the burning issues in society and able to solve the farmer's problems, there is need to increase the field visits, industrial exposer tours and training for improvement in the soft skills. It if these types of changes were implemented in their course curriculum, to create a direct link between their education and the societal debate on these topics. The results of student's survey; opinion of UG students about present course curriculum 47 % of the UG students strongly agree that needs to include more field visits, 43, 36 and 41 % agreed that matches required in self entrepreneurship, job in govt. and private respectively. Master degree students opinioned that, 60 % strongly agreed that needs more field visits 63, 35 and 48 % agreed that matches required in self entrepreneurship, job in govt. and private respectively. Whereas, 38 % of the Ph.D. students strongly agree that needs to include more field visits, 52, 38 and 38 % agreed that matches required in self entrepreneurship, job in govt. and private respectively (Table 4 to 6).

Feeling on completion of the course

Irrespective of the degree programmes the students felt that about 47 % students are strongly agreed to say I am satisfied with the knowledge I have gained from the course to start my own farming/business, 49.00 per cent are I am feeling proud to have completed this course, 39 % are I would recommend this course for others. 42.00 % are agreed that I consider this course at par with other professional degrees. Whereas, 29 % of students are strongly disagree that I regret joining this course, 22 % agree, 23% neither agree nor disagree (Table 7).

Table 4. Opinion about the Course Curriculum of UG Programme n=184

SN	Particulars	Opinion/Perception* (%)				
		1	2	3	4	5
	The present course curriculum					
1	Matches requirements of self-entrepreneurship	24	43	22	9	2
2	Matches requirements of job in govt. sector	26	36	26	8	5
3	Matches requirements of job in private sector	22	41	20	14	4
4	Covers more of theory than practical sessions	19	26	32	21	3
5	Is loaded with heavy course work (lot many credits)	22	35	18	17	8
6	Has lot of repetition / overlapping	15	29	27	21	8
7	Needs to include more of field visits	47	24	12	10	7
8	Is more focused on providing information than imparting problem solving skills	28	30	26	9	7

* 1=Strongly Agree, 2=Agree, 3=Neither Agree nor Disagree, 4=Disagree, 5=Strongly Disagree.

Table 5. Opinion about the Course Curriculum of PG n=40

SN	Particulars	Opinion/Perception* (%)				
		1	2	3	4	5
	The present course curriculum					
1	Matches requirements of self-entrepreneurship	18	63	13	5	3
2	Matches requirements of job in govt. sector	30	35	28	8	0
3	Matches requirements of job in private sector	25	48	10	13	5
4	Covers more of theory than practical sessions	18	35	20	25	3
5	Is loaded with heavy course work (lot many credits)	30	8	25	18	20
6	Has lot of repetition / overlapping	28	18	28	20	8
7	Needs to include more of field visits	60	20	3	10	8
8	Is more focused on providing information than imparting problem solving skills	30	45	15	0	10

* 1=Strongly Agree, 2=Agree, 3=Neither Agree nor Disagree, 4=Disagree, 5=Strongly Disagree.

Table 6. Opinion about the Course Curriculum of Ph.D n=21

SN	Particulars	Opinion/Perception* (%)				
		1	2	3	4	5
	The present course curriculum					
1	Matches requirements of self-entrepreneurship	10	52	29	10	0
2	Matches requirements of job in govt. sector	10	38	24	0	29
3	Matches requirements of job in private sector	33	38	14	5	10
4	Covers more of theory than practical sessions	14	24	52	5	5
5	Is loaded with heavy course work (lot many credits)	10	14	57	19	0
6	Has lot of repetition / overlapping	10	52	29	10	0
7	Needs to include more of field visits	38	19	29	14	0
8	Is more focused on providing information than imparting problem solving skills	14	43	24	5	14

* 1=Strongly Agree, 2=Agree, 3=Neither Agree nor Disagree, 4=Disagree, 5=Strongly Disagree.

Table 7. Perception about/feeling on completion of the course n=245

SN	Particulars	Perception* (%)				
		1	2	3	4	5
1	I am satisfied with the knowledge I have gained from the course to start my own farming/business	47	35	10	6	2
2	I am feeling proud to have completed this course	49	37	9	3	2
3	There are good prospects of getting a job after graduation	33	37	19	8	4
4	General public considers this course at par with other professional degrees	32	37	20	9	3
5	I consider this course at par with other professional degrees	28	42	21	5	4
6	I regret joining this course	15	22	23	10	29
7	I would recommend this course for others	39	33	20	5	4

* 1=Strongly Agree, 2=Agree, 3= Neither Agree nor Disagree, 4=Disagree, 5=Strongly Disagree

Table 8. Opinion regarding conduct of classes and quality of teaching n=245

SN	Particulars	Opinion* (%)				
		1	2	3	4	5
	Quality of teaching					
1	Knowledge up gradation of faculty in respective field	37	32	19	10	2
2	Practical exposure given to students	30	36	20	10	3
3	Practical knowledge of teachers	34	36	20	4	7
4	Adequacy of no. of teachers in each subject/course	22	40	21	9	8
5	Use of AV aids and Multi-media in teaching	25	36	22	10	7
6	Interaction between students and teacher in the class	27	31	25	12	5
7	Approachability and friendliness of teachers	25	37	22	10	7
8	Punctuality of teachers in taking class	33	33	22	9	4
9	Evaluation/examination system	29	33	20	8	11
10	Complete coverage of syllabus	25	36	24	8	7
11	Punctuality in conduct of examinations	42	33	12	7	4

* 1=Fully Satisfied, 2=Somewhat Satisfied, 3=Neither Satisfied nor Dissatisfied, 4=Somewhat Satisfied, 5=Fully Dissatisfied.

Conduct of classes and quality of teaching

The students opinion regarding conduct of classes and quality of teaching are presented here under 47 % are agreed about quality of teaching, 37 % strongly agreed, 36 % are agreed about practical exposure given to students and practical knowledge of teachers, 40% agreed about adequacy of no. of teachers in each subject/course, 36 % are agreed about use of AV aids and Multi-media in teaching, 42 % are strongly agreed about punctuality in conduct of examinations and coverage of syllabus by teachers (Table 8).

Disciple wise quality, skill issues and Institutional Mechanisms

In case of Agriculture, Agriculture marketing and Agri. Engineering, Home Science, Food Technology disciples, there is a great demand for practical-oriented agricultural education from industries as well as from students. About (75%) of graduates working in the industries are frankly expressed that what they learned/ gained knowledge from their education is partly adequate to hold the job.

Teachers expressed that presently substantial component of practicals was already there in the syllabus, but students and industries felt that the emphasis on practical's was not enough to make students employable. Hence, at graduation level itself student's needs to involve more in practical oriented aspects as a course curriculum. It is necessary to provide the students more practical orientation from time to time so that they could have mastery over some subjects as well as development of soft skills. There is a need to limit theory classes and introduce other methods such as group discussions, case studies, presentations by students, quizzes, interaction with experts, conferences, and research paper presentations and so on.

Experts and industries opined that students are lack of in-depth knowledge of subjects. It is better to attaché students with farms and industries for a few days the training at mid of the graduation instead of final year or fag end of their education. Hence it helps to students to discuss with faculty after knowing the problems of industries. Major reason for the lack of skills and knowledge of students is the depleted faculty strength, lack of manpower in frontier areas, inadequate hands-on skills and lack of research experience which leads to lot of work load for the existing faculty.

It is observed that non-government sector; private corporate sector in future will emerge as major employer for agriculture graduates. They expressed that the students, who take up employment in agriculture sector, leave the job as soon as they get a better employment even if it is not in their specialized field. This problem could be addressed treating agriculture at par with other professional courses to make the sector attractive to professionals. Hence, Human resources retention is of concern to some employers. Private companies and organizations employing many basic or other diploma /degree holders, even for positions requiring Agriculture and allied sector graduates, for continuity in business as many of the agriculture graduates frequently leave the job and demanding high salary as compared to other general degree graduates. They prefer to have more diploma holders for routine works in their various field related work and other operations. Industries would like to employ. Agriculture graduates in preference to general graduates for many of their requirement if the agriculture graduates are ready to do all type of work.

In case of Horticulture, it is evident from the students survey it was observed that some of the lacunae in horticulture education such as, large number of courses were taught at the undergraduate level enabling the students to pick up only a little information about everything. No subject was taught in-depth which could give specific skills to the students in at least a few areas. Curriculum was not practical oriented (means not much industry oriented). Presently, students are attached with industries, farms and other organizations only for a few days. The training at these places remains limited to observation only. Hence, they hardly got less practice in the farms or industries. Better to provide the students more practical orientation from time to time so that they could have mastery over some subjects as well as skills. It was also pointed out that the syllabus of graduation should be revised involving industries, students and faculty together.

In forestry course, the emerging areas for employment in this field are - forest certification, environmental science, wood and paper technology, products from medicines and herbs, nursery management, plantation management, forest protection, climate impact, carbon credits, *etc*. There is no focused forestry activity with respect to pasture, grass land management in forest area. Hence, there is a lot of demand is there for trained skilled human resource in this area to work at ground level. As stakeholder opined that limited job opportunities in the private sector to the forestry graduates makes forestry degree program is not much attractive for students. Majority of graduates opting for higher studies as they are not getting suitable jobs after graduation. Therefore is a scope for employment opportunities in agro processing (wood and paper) industries products by providing advanced training and knowledge in these industry thereby making students to compete with national or international level.

The major issues in sericulture are; It has been reported that quality of students joining to the sericulture education is coming down. Students are more attracted towards agriculture courses as compared to sericulture courses. Thus, students who join sericulture generally do not come by choice. In order to attract talented students to the course, there us need to revised curriculum with addition of more practical's on advanced sericulture technology. Basic foundation for Self Entrepreneurship development has to begin at college. Also courses like project planning, finance, *etc*. to be taught more effectively. Need to focus on creation and make available the quality teaching material and need to promote books & teaching aids for rhe benefit of teachers and students.

The major issues in Animal Husbandry and Veterinary Science are: qualified and trained people are needed who can handle the practical aspects relating to livestock such as artificial insemination, embryo transplant, and vaccination of

animals, etc., with a professional approach. At present, the students coming out of the veterinary education have inadequate practical orientation. In addition, Veterinary & Animal Husbandry education is not producing entrepreneurs. Students lack business abilities and communication skills. Veterinary & Animal Husbandry course should be able to develop entrepreneurial skills. Therefore, there is a need for emphasis on development of quality human resources in the following sectors to meet the future growth and challenges in the sector. The poultry industry has tremendous potential for growth but there is a dearth adequate human capital to make the poultry industry profitable, similarly lack of scientific slaughter houses for the pork industry in the state. The state has considerable goat and sheep population but milk is not being used properly. New areas have emerged in this sector such as impact of climate change on animal health and production of milk production.

It is evident from student's survey that most of the fisheries students joined to the fisheries course are by chance. They joined fishery because they didn't got veterinary so. Even after completion of undergraduate in fisheries, they go for higher studies like MBA or they try for jobs in Middle East and other African countries where there is a demand for fishery educated personnel with higher incomes.

There is a grater scope for self-employment in the state but presently only less than one per cent of the professionals in fisheries are getting attracted towards the self employment. There is a need to motivate the students passing out from fisheries colleges to take up self-employment in seed production, growth promotion, fish feed, processing and storage industries in the state. In addition there is a scope to establish super markets in the rural areas which are potential employment of fisheries. There is requirement of introduction of entrepreneur and business development and communication skills courses in final year of degree program.

There is need for introduction and upgradation of the marine engineering courses, since marine aquaculture and navigation are the major areas of fishery sector in which lot of demand for skilled human resources are requirement to improve marine fishing technology

The fishing activities are majorly taken by uneducated person/ farmers in rural areas, the researches going on in the sector should be disseminated in a simple language so that farmers can understand the new innovations. Hence, along with the routine course curriculum it is very much essential to include communication skills, training on local languages *etc*.

Strategies to improve the quality of Agril. Education

It has been observed that, there is a diversified employment opportunities in private sectors as compared to public sectors. Therefore there is a need for revised curriculum of course towards more practical oriented than theory. There is a need for improving in technical, managerial and communication skills of graduates to meet the needs and expectations of employers. As of now there is no specific training policy for up- gradation of the knowledge and skills of teachers in emerging areas of concerned subject. Therefore a plan of action has to be evolved so as to cover all the teachers under capacity development programme in a specific period of time. Therefore, Need to create the teacher training units in the state similar that of HAU, Haryana and NAARM. There is need for creating and maintenance of centralised database of all education, research and extension activities at University level. This database would help for identification and prioritization of research, education and extension activities at university level, state and national level. Data Analytical Cell (Data Science) needs to be established conduct research on farmers and other stakeholders problems in addition to support for education planning. Adequate institutional funding and infrastructure and effective management are some of the areas that directly made an impact on quality of education. Focus should be made towards up gradation and increase the infrastructure facilities in existing and new colleges.

To conclude, quality of Agricultural Education means "Developing a capabilities (knowledge, skills, attitude and commitment) of students they require to become economically productive, and develop sustainable livelihoods of farmers"

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