

Possibilities of Agricultural Education for Secondary Level in Pakistan

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Abstract *Agricultural education is the main component to promote development and production of agriculture. In Pakistan, higher education institutes are offering agricultural education at undergraduate, graduate and postgraduate levels. F.Sc. Pre-Agriculture program has also been started in selected universities of agriculture. At the same time, the subject of agriculture has been part of elementary schools for many years. But, the gap still exists for the provision of agricultural education at secondary level. So, the study aims to review the initiatives of agriculture education at secondary level in national educational policies and five-year plans and to explore the possibilities for the promotion of curriculum for agricultural education according to opinions from agricultural education experts. This offers a descriptive study. The study was conducted in two steps. Documentary analysis technique was firstly used. Further, the need of agricultural education curriculum for secondary level was assessed and possibilities of agriculture education were explored. Purposive sampling technique was used to select subject specialists. The data was analyzed with frequencies and percentages. The qualitative data was analyzed by themes and analytical approach. This research suggests that agriculture education is highly desirable for introduction at secondary school.*

Key Words:

Agriculture Education, Secondary level, National Educational Policies

Introduction

Agriculture is the largest division of economy like industry and trade for any country and Pakistan is one of them. In Pakistan, around 60% people live in rural areas. Among them, 42% labor force relate to farming (Usman, 2016). Besides this, we are lacking some food items and import some items from neighbor countries. It is vital for expansion of agriculture to increase production of food yields, grip additional labor and yield superior farm income.

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Agriculture subsidizes to the revenue of the labor power, to Gross Domestic Product GDP and to the external trade incomes. Agriculture is the substance of food and backbone of the nation, and likewise the greatest source of the items of daily usage and labor force to progress the services division. No technique of financial development can be understood without extended and prevalent agricultural expansion.

Government took numerous actions to recover agricultural productivity. In addition to these actions, there is prerequisite to train the agriculturalists to decrease the problems and difficulties tackled by them connected to low efficiency. It is necessity of the period to increase research in agriculture. On the rural level awareness of agricultural labor force entails complete steady agricultural education in universal and crop production. Though, the objective of agricultural education and training is to sponsor in the economy by endorsing human resources in agricultural community. The key purpose is to spread on knowledge via teaching and research to fulfill the requirements of agricultural export, production and native feeding in a tremendously competitive world trade setting. The social initiative is to support smallholders and the rural people with food sanctuary and income generation under situations of cumulative population and increasing land scarcity. So, this is the hypothetical argument for investing in human capital development for agriculture.

Agricultural education is as vital as other functional subjects in the list of courses. It is highly mandatory at all stages for a country with an agriculture-based economy. The agriculture institutions and universities in Pakistan are equipped. They can produce well capable personnel in Agriculture, who can use advance technology and conduct research for better farm production. There are several public-sector universities and colleges offering an eclectic range of graduates from Bachelors to Doctoral levels in agricultural disciplines and its particular parts to prepare the human resources in agricultural fields. Some selected Agriculture Universities of Pakistan offered the intermediate pre-agriculture program along with under graduate, graduate and post graduate programs. But there is still gap at secondary level (IX-X) and it is desirable to fill this gap with agricultural education.

Agricultural education is not functional at secondary school level. National educational policy 1972 introduced a separate stream of agricultural subjects (Agro-tech) started from middle school stage. At secondary level it was offered as a subject under 'Y' list of subjects. Some hindrances occurred later as consequences of political set-up and it wasn't become functional. Though, it sustained to transform its origins in the structure under diverse nomenclatures in literature review. Later, national education policy 1998 advocated shifting this subject to the matric technical stream. But the stream was restricted to technical education under the sphere of technical exam boards. According to white paper published by Government of Pakistan (GoP, 2007) and educational policy 2009

the newly developed scheme of studies of secondary school certificate the name of agriculture education subject is comprised in humanities group, but still it is not functional at secondary level. Nevertheless, with the increasing cognizance of the country's economy being reliant on agriculture, there is necessity to lay emphasis on agricultural education at school level in a broader range of secondary schools.

As mentioned above, the curriculum of agricultural education in Pakistan is transitory. This study plans to trace the drifts of agricultural education at school level as a political commitment demonstrated in national five-year developmental plans, and national educational policies develop by the ministry of education and related administrative developments of provincial governments. The study would provide considerable documentary evidence about the obligation and efforts made through implementation. It is also significant to inspect the need of it for further education. Finally, this study explores the possibilities for agricultural education for secondary level according to documentary analyses and diversified opinions of the agricultural experts.

Objectives of Research

The following objectives were formulated for investigation.

1. To review the initiatives of agriculture education at secondary level in national educational policies and five-year plans.
2. To assess the need of agricultural education for secondary level as terminal stage and agricultural practioners.
3. To explore the possibilities for agricultural education at secondary level (IX-X) according to views of experts from universities of agriculture.

Review of Literature

For survival of a nation, natural resources must be exploited. This is all the important for an agro-based society. Mitchell (1998) examined that agriculture education is essential to enhance the economical level of the nation and several other factors contribute to this aspect. Prior purpose is to deploy knowledge through instructional activities and approved modern methods to improve the production and to gain compatibility with modern needs for agriculture growth and needs of the nation. Jamaluddin and Alias (1997) observed that the major purpose of establishing the agriculture institutions was to train graduates about investigating research approved technologies and strategies to promote farm related methods for production, growth and climate. Diao and Hazell (2004) reported that most of underdeveloped nations were focusing to enhance their economical level through the improvement in the industrial and agriculture sector. To achieve the required economical level the resources and trainings need integrator in the instructional technologies of agriculture growth with major focus

placed on rural areas. Dorward et al. (2004) highlighted that economic strategies of developing countries were rarely addressed the resources and instructional strategies. Agriculture sector seemed neglected in terms of resources and integration of new production methods and techniques and it was limited to farm level effort. Although several countries took promoting measures to this challenge.

Alam (2008) narrated that educational policies in developing countries mainly focused on the technical education resources and industrial growth. Alam (2009) mentioned that better production in agriculture demanded educational policies equipped with resources to educate and train the interested candidates for attractive employment opportunities. Instruction in agriculture education in secondary education has gained a world-wide impetus to Crop production, livestock management, soil and water conservation and various other aspects of agriculture (Schultz, Wiekert, Howard, & Dickson, 2008).

Agriculture education in Pakistan received a marginal attention compared to other components of social sector. In Pakistan the First Education Conference (1947) introduced technical vocational subjects at secondary school level to provide chances to the rural based people and to release pressure to labor market in cities (Govt. of Pakistan, 1947). In 1950 a Technical Educational Committee formulated the scope of vocational education at secondary level. In 1951 is a joint Conference of a central Education Board, Inter University Board (former UGC to HEC now) recommended that agriculture and commerce should form compulsory part at secondary level. In 1950, observing these recommendations Technical High Schools were established in the country under Columbo Plan. In these schools traditional as well as vocational subjects were introduced (Govt. of Pakistan, 1957).

In follow-up National Educational Commission (1959) changed the nomenclatures and Multipurpose and Comprehensive schools were established all over the country. Agriculture formed one of the components. However, this trend remained optional to the students and students largely selected technical and vocational courses. The education policy strengthened vocational and technical educational and highlighted the trend under a new nomenclature under agro-technical courses. At middle school level, it was a compulsory component. The proportional involvement of agro-technical various classes was 13% in class VI, 18% in class VII, 22% in class VIII, 25% in class IX-X (Govt. of Pakistan, 1959).

The third five year plan included broadening the base of education at primary level; accelerating the development pace of technical education (including agriculture) and improving the quality of education at all levels with emphasis on science subjects. The war with India put the program back. This led to a 50% provision for education of the total plan allocation (Govt. of Pakistan, 1965).

The national education policy (1972) recommended to expand agro-tech subjects in a phased and continuous manner. The purpose was to provide essential information and skill to develop the spirit of manual work. The component was

launched in 6007 schools where about 567,115 students were studying. The 'Z' list in this level of studies at secondary levels offered a wide range of technical subjects to achieve purpose. Both urban and rural schools chose at least two subjects for skill development at secondary level. It was however, a non-exam offering (Govt. of Pakistan, 1972).

The initiative was carried forward by the initiative of national education policy (1992) and made agro-tech education as a scientific. The policy attempted to relate education to the world of work offering more opportunities to the emerging demands of technologies and information explosion. The policy stressed those vocational courses should form integral part of secondary schooling and at-least one compulsory vocational subject be offered that secondary level (Govt. of Pakistan, 1992). Agrotechnical and vocational courses introduced as elective subjects at secondary level to produce young boys and girls as semi-skilled workers (Govt. of Pakistan, 1998). In educational policy 2009 agriculture subject get status of one of the elective subjects in humanities group (Govt. of Pakistan, 2009). In recent national educational policy 2017 analysis of Agro-technical education and Matric Tech Streams in comprehensive schools was discussed and some causes for failure of these schemes were mentioned (Govt. of Pakistan, 2017).

Methodology

This research was descriptive. The study uses documentary analysis and Delphi technique for data collection. The data consists of quantitative and qualitative form. Descriptive research is apprehensive with discovering about "What is". It contains assembling data to test proposition or to answer the enquiries concerning the position of the respondents of the research study. According to Gay (1987), the descriptive method is convenient for studying a variability of educational problems.

Population and Sample

Population of research was the experts of agricultural disciplines from Agriculture universities of Punjab (Pakistan) and curriculum development experts from Ministry of Education. Purposive sampling technique was used to select the sample from agricultural universities. A sample of fifty-one experts was selected through purposive sampling technique, agricultural education curriculum experts were selected through Ministry of Education Islamabad, teachers of agricultural departments from agricultural universities. The rationale was to reach the most relevant people who could make a rich contribution based upon their experience.

Tools of Research

Documentary analysis was conducted to collect data these documents includes:

- i) Eleven five-year development plans of GOP from (1950-2013-18)
- ii) Educational policies from 1947-2017

Second tool was Delphi questionnaire which was used to take opinions of experts and on the base of consensus of responses, experts' opinions were validated.

Data Collection

Data was collected in structured manner in academic year 2015-16. Thus, the data collection in this investigation typically reports the educational culture of the country, leading to generalizability.

Results and Discussion

Table 1. Review of National Educational Policies (Main Points about Agriculture Education)

Years	Main Points
1947	Vocational subjects were highlighted to rural people. It is essential for everyone to get knowledge of scientific and technical education.
1959	Agriculture should be introduced as an elective course in practical arts courses, poly-techniques and technical institutes.
1970	Agriculture as an important discipline and treated it as part of technical and vocational education.
1972	Federal Ministry of Education drafted a Scheme of separate stream of six agricultural studies or the SSC.
1979	Optional agricultural subjects would be offered. Indigenous Agro Based Skills would provide for one-year duration for further admission in Vocational schools
1992	The policy treated technical and vocational institution with marginal treatment to Agriculture education and built it up as a branch of Technical Education.

1998	The conceit of agro-technical and vocational courses introduced as elective component of class IX-X. The objective was to produce young boys and girls as semi-skilled workers.
2009	Agriculture carrying equal weightage as one of the options in core subjects as other elective subjects under humanities group.
2017	Induction of agro-technical education and Matric Tech Streams in Technical and Comprehensive schools have received some mention.

Table 2. Review of National Five-Year Plans in Relation to Agriculture Education

Years	Main Points
1955	Proposed a change at secondary level with courses in technical, commercial and agricultural subjects.
1960	Improvements in secondary schools and broadening of technical, commercial and agricultural subjects
1965	New strategy on agriculture subject recomposed moderately.
1970	Emphasis given on rural schools for providing the facilities of teaching farm techniques and other related subjects.
1978	The indigenous system of cultivation was changed. The use of chemical fertilizers, mechanization, emergence of tractors, replacing the ploughs formed the symbols of agriculture development.
1983	The program of agro-technical groups of subjects' industrial arts, agriculture and commerce would be strengthened.
1988	Substantial improvement and expansion of technical and vocational educational facilities.
1993	The plan envisaged school mapping exercise and using non-formal and indigenous structure.
1998	Need to develop agro-based industries in rural areas and small towns.
2013	Introduction of Matric Tech scheme raising it to higher secondary level in technical and vocational education offered in poly technique institutes and by establishment of college of technology.

Table 3. Demographics of Experts

Designation	F	Experience (Years)	F
Lecturer	05	1-5	14
Assistant Professor	34	6-10	11
Associate Professor	07	11-15	11
Professor	05	16 & above	15

Table 3 presents the designation of agricultural experts; five lecturers, thirty-four Assistant Professors, seven Associate Professors and five Professors participated in research process. Regarding professional experience of participants, fourteen experts have 1-5 years of experience. There were fifteen experts available having their professional experience of 16 & above. This study was conducted by taking the responses of experts about the need of agricultural education at secondary level. Fifty-one experts took part in this research and gave their opinions under option of yes or no about the need of agricultural education curriculum for secondary level in relation to base for F.Sc. Pre-Agriculture and as terminal stage.

Table 4. Responses about Need of Agriculture Education Curriculum at Secondary Level

Item	Responses			
	Yes	%	No	%
Need of agricultural education curriculum at secondary level	48	94	3	6

Table 4 shows the responses of experts; fifty-one respondents fill consent form to participate in research study among them forty-eight (94 %) were agreed with the need of agricultural education curriculum at secondary level. Only three (6 %) respondents selected negative option (no). Their responses were such as described below:

1. There isn't any need of agricultural education at secondary level because students have already two major options of science and humanities group.
2. There is higher education in this subject and little information is also added at middle level, so it is not required at secondary stage.
3. Not necessary because those who want to study in it can earn graduate and post-graduate degrees in it.

According to three respondents' agriculture education is not required at secondary level because it already exists at elementary level. There are two major groups Humanities and Science that are sufficient at secondary level. And the students who require an agricultural occupation or profession can get higher education in this field.

The Experts who are agreed with the need to teach agricultural education at secondary level were asked to suggest the way in which agricultural education

curriculum may be taught. And they suggested four possibilities to teach agriculture at secondary level. These possibilities are listed as:

Agriculture subject may be an elective subject in science group

1. It may be taught in integration with other subjects
2. It may be taught as separate group of agricultural subjects
3. Agriculture subject may be an elective subject in humanities group

Table 5. Major Propositions Suggested by Experts

S. No.	Propositions	Frequency	%
1	Elective subject in science group	32	66
2	Separate group of agricultural subjects	11	22.9
3	Integration with other subjects	4	8.3
4	Elective subject in humanities group	1	2.08
Total		48	100

These four major possibilities were explored, table 5 shows that 32 (66%) participant/ experts suggest agriculture may be part of science group. 11 (22.9%) experts suggest that there is need to launch separate stream of agricultural subjects, 4 (8.3%) experts suggest that agriculture may be integrated with compulsory and elective subjects, only one respondent (2.08%) suggested that agriculture may be included in humanities group.

Table 6. Weight Age/ Percentage of Practical in Agriculture

Percentage of Practical	Frequencies	%
No practical	1	2
10%-19%	2	4.1
20%-29%	16	33.3
30%-39%	6	12.5
40%-49%	4	8.3
50%	19	39.5

Table 6 indicated the weight age of practical in Agriculture. 19 (39.5 %)experts said that practical component may be 50%, 16 (33.3%) said it may be 20-29%, 6 (12.5%) experts responded to 30-39%, 4 (8.3%) experts responded to 40-49%, 2 (4.1%) responses highlighted that it may be 10-19% and 1 (2%) expert said there isn't need of practical in agriculture at secondary school level.

Analysis of Open Ended Items: Consensus of Experts about Agricultural Education Curriculum at Secondary Level

It should be compulsory because we are agricultural country. And it should be specially taught in rural areas. It can be one subject but not specialization.

Students should go to tours for field related tasks to different agricultural universities and research institutions. Field and farm visits and industry exposure should be given to students.

Kitchen Gardening and training should be provided to students. Short training should be provided to students, so they can utilize their time and earn. Students should be provided practical knowledge and make them able to develop their own products.

Chemistry of Agriculture molecules, soil and environment and engineering part must be added to it. Identification of insects, pests and plant diseases should be teaching to students. Agriculture should attach with basic sciences. Mathematical calculations should be added to the curriculum of Agriculture. Plant sciences, zoology, human nutrition should give much importance than biology. Super crops knowledge should be put in agriculture. It should not be conventional and should be based on new knowledge. Research activities and practical should be part of it. Extension wing should be relating to farms and should be part of it. Knowledge about post-harvest and value addition should be given to students.

Some experts suggest that basic knowledge should be given to students at secondary level and agriculture is an applied science, so it should not be taught at this level. Diploma in agriculture can be launched after matriculation.

Some experts also suggest that basic abilities should be developed here. Attitudes, ethics and interaction or selection abilities can be developed in the students in any form, but not as a professional certificate or degree. It is not good for urban students.

Findings

Some major findings were generated on the base of results.

- Most of the Experts 94% agreed with need of agriculture education at secondary level, only 6% disagree with the need of agriculture at secondary level.
- Three experts 6% who negate the need of agriculture said that:
 - There isn't any need of agricultural education at secondary level because students have two major options of science and humanities group.
 - There is higher education in agriculture subject and little information is also added at middle level, so it is not required at secondary stage.
 - Not necessary because those students who want to study in it can earn graduate and post-graduate degrees in it.
- 66% experts suggested that agriculture can be a part of science group. 23% experts suggested that there is need to launch a separate stream of agricultural subjects. 8% experts suggested that agriculture may be integrated with compulsory and elective subjects; only 2% respondents suggested that agriculture may be included in humanities group.

- Experts suggested that practical component may be add to agriculture as: most of the experts (19) out of 48 suggest that practical component may be 50%, 16 said it may be 20-29%, 6 experts responded 30-39%, 4 experts responded 40-49%, 2 responses highlighted that it may be 10-19% and 1 expert /said there isn't need of practical in agriculture at secondary school level.
- Tours for field related tasks to different agricultural universities and research institutions for students is necessary. Field and farm visits and industry exposure should be given to students.

Discussions and Conclusions

The aim of the research was to explore the possibilities to propose the agriculture education curriculum for secondary education in Pakistan. This research was conducted through review of documents (national five years educational plans and national educational policies) and questionnaire was used for exploration of experts' views. The finding of this research suggested that Subject of Agriculture at secondary level is needed in Pakistan, because it is presented at other levels specially for F. Sc. pre-agriculture and being agricultural country student may need to know about this field, it may also beneficial for those who terminate after matriculation. Four propositions of curriculum were explored. Major or number one proposition in experts' opinion was placement of agriculture education in science group as an optional subject because agriculture is basic and applied science. Some suggest that it may be a part of biology but not appear against biology like computer. The second suggestion of expert was that there may be a separate stream of agricultural subjects parallel to Science and Humanities group as 'Y' list describe in National Educational Policy 1972. The third proposition was to integrate some concepts or topics of agriculture education in other compulsory and elective subjects. Fourth possibility got less weightage of opinions from experts to include this subject under humanities group of subjects.

It was find out that 25% to 50% weightage of practical is good to learn knowledge of agriculture because agriculture is applied science. Some experts suggested that practical weightage should be same as the other science subjects have in matriculation. Farm is not needed in schools to teach agriculture, any school that is prepared to teach Biology and Botany laboratory method can teach agriculture and teach it factorially.

Recommendations

Agriculture education needs to be viewed as important as other subjects in the secondary schools. The effectiveness and feasibility of the teaching of the subject must be proper and various aspects of the instructional materials must be used.

The curriculum of agriculture may be developed and may be functional on the proposed possibilities of the research.

The Agricultural education may similarly emphasis on theoretical as well as practical feature of farming. The period and extent for practical may be enough to get more experience of the actual world of farming.

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