

## A REVIEW PAPER ON AGRICULTURE MANAGEMENT

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### Abstract

Agriculture has been practiced in every world country since ancient times as life sustaining activity, when other development industries have not even existed. In Indian context, India was a net food grain importer in the early 1960s and has now been emerged as exporter of numerous agricultural commodities. As a result of the effects of globalization, marketing and development have become the buzzwords in the agriculture industry, also the development in biotechnology, precision farming and use of various highly mechanized techniques have led to a paradigm change in the field of agriculture. In addition to the government's unique focus on privatization, farmer associations, public private partnerships, entrepreneurs also have shifted towards the agricultural growth. Moreover, involvement of erudite person has also played a vital role in achieving the development in agriculture sector. With the advent of chemical manures, new and improved plant variety with less dependence on climatic condition due to technological advancement has improved the agriculture condition. In result, agriculture has emerged as amalgamation of science, business and commerce..

**Key words:** Agriculture, Crop, Farmer, Harvest, Management, Soil.

### Introduction

Agriculture management is a collective term for the different management techniques and practices utilized to keep the agriculture active, efficient and profitable. The process of agriculture management is mostly considered in terms of large agricultural farms, but these techniques can also be used successfully in a small cultivable land too. Efficient farm management is, in many ways, similar to the management systems used in any form of industry. There are actions that must be taken on regular basis, as well as procedures that must be followed by all participating in the process. Any participants are accountable to supervisors or administrators who, in exchange, are accountable to their owners. What differentiate farm management than other money-making activities is the kind of tasks should be performed on day to day basis and the degree of management required into this operation. Even between different yield farms, this procedures can differ on the basis of the form of farming enterprise involved and total scale of operation. For instance, the basic activities involved for the successful management of dairy products may be very different from those related to the functioning of a barley farm.

Mostly large commercial prefer new technologies to improve the productivity of the management process. Special software that enables tracking of units made, unpaid expenditures, units under process and pending orders helps to automate a variety of management activities. Additionally, this software helps in the management of, state-of-art machinery for plantation, processing, repair and also helps to increase the production of farms of all sizes. And small-scale farmers may learn from management advice. Consulting with an agriculture manager enables consultants to determine the actual state of the farm and make constructive recommendations about how to improve the production and profit margin of the agriculture. Managers delegated to an organization/land will oversee the execution of recommendations while teaching family members and hired staff can continue to make the most of the additions[1].

As in several career opportunities, field training usually entails a mix of formal studies in a university or university degree program and work experience. Any degree programs enable students to serve as interns in commercial farms before obtaining their professional qualifications. However, also for a long time, farmers can learn basic management with the use of resources available from different farming associations and agencies. In the present time many reputed institution in India like Indian Institute of Management (IIM) Ahmedabad and others are offering courses in agriculture management which indeed positively affects the society to consider agriculture not only as life sustenance activity but it should be taken as a science and a business with great commercialization possibility [2].

### **Literature Review**

In the present time, agriculture management has attracted much attention because of the several affecting issues in this particular field. Now it has gained much importance with the main research thrust in this field by many world countries. Several innovative steps have been taken to secure the harvest due to increased food demand of the expanding population. E. Fereres and D. Connor have analyzed many such issues based on the water management in agriculture by providing the alternative ways to recycle irrigation water and sustainable water management [3].

In spite of such adverse climatic condition in Canada, it is believed that maintenance of soil health is of extreme importance as soil promotes the sustainability of the most of food, fodders, fibers and leads to the well-being and economic prosperity of Canadians. In the agricultural term, the soil health also synonymous to the soil quality, as its fitness decides the promotion of the crop growth without degrading or exerting any harmful effect over the ecosystem. Health of Canada's agricultural soils present key results of recent studies on soil organic matter and soil composition, soil degradation processes, erosion, salinization, presence of chemical pollutant, groundwater contamination, role of land use, and other management activities to control degradation, soil quality enhancement along with preservation activities. Most farmers know from their experiences that the soil cannot support the quality crop throughout the year and it also needs the rejuvenation [4].

Our environment performs life supporting functions. It is a pool of gases on which every life form depends as per their need and requirements as: nitrogen and carbon dioxide for the growth of plants, requirement of oxygen for breathing, need of water vapors to form rain droplets that refreshes the soil. It isolates the earth from high temperatures and filters out toxic solar radiation. It also detoxify the compounds emitted into it, either by accelerating their degradation or by diluting and dispersing them. One of the most notable harmful effect seen in the recent years is the Greenhouse effect as a resultant of the rise in emissions of certain gases such as: nitrous oxide, carbon dioxide, methane and chlorofluorocarbons (CFCs). These gases absorbs the atmospheric radiation from the planet and heats the troposphere. As a result, these rising of greenhouse gases will raise the global temperature over time to the alarming level. These changes may affect the climate and the health of environment which in turn would affect the agriculture because it mainly depends upon the climatic conditions in many of the world country [5], [6]. For example rabi and kharif crops in India is sown in a particular time which corresponds to the climate condition of that period. Any sudden change in climatic condition can adversely affect the crop.

### **Discussion**

The present study has been performed by extensive research and analysis on the factors involves in a sustainable agriculture along with profitable aspect. This work covers different aspects of agriculture management which should be considered for a profitable and balanced agriculture. This study has been performed with help of online available sources. During the investigation there has been taken various data from different sources as research papers, journal articles, webpages based information, book chapters, government reports and other information based on agriculture management or relevant topic. Figure 1 shows the flow diagram of the agriculture management.



Figure 1: Illustrates the flow diagram of the agriculture management.

### **3.1 Crop protection:**

Crop protection includes all functional facets as pest management, disease control, plant control, by controlling the following: microorganism generated plant diseases, animal pests control, evaluation of damaged crop by pest or any disease, epidemiology of pests and diseases, developing toxins in crops, effect of bio-rational pesticides over the plant growth regulators, developing methods of administration of pesticides, applications for genetic engineering for new variety development, environmental impacts of pesticides, monitoring of post-harvest loss in crop and other economic considerations as bio monitoring, methods of agronomic regulation, integrated controls, control of pests, interrelations among the control strategies, food safety, weed management and damage caused by abiotic factors [7].

Weeds are unwelcome plants that emerge along with crops. These undesirable plants remove nutrients, sunshine, water and other resources from crops and affect their growth, which results in undernourished crops and reduces yields. In order to safeguard the productivity of crops, farmers eradicate these weeds by means of a method called weeding. There are different ways of weeding:

1. Spraying weedicides against the weeds.
2. Manually plucking the weeds by hand.
3. Removal of weeds by trough and harrow.
4. Ploughing the field to kill the weeds until the seeds are sown.

Few examples of weeds are Amaranthus, Cyperinus rotundus, Bermuda grass, etc. [8]. A recent research on crop protection underlines that successful crop protection strategy needs a machine perspective. Crop security is part of a development mechanism that stretches from farmers to foreign supply chains. In order to prevent undesired side effects, the impacts must be balanced against all the goals of the common agricultural policy (CAP). For

example, a very restrictive policy might reduce the use of chemical Public–private partnership (PPPs), reduce yields and cause land conversion to farmland.

The future additional costs of less risky activities would not be limited to producers. Farmers can select the most cost-effective approaches to pass on additional costs to suppliers and consumers. Moreover, strategies must guarantee a decent income for farmers, as one of the goals of the CAP. Foreign commerce is also poses threats. Phytosanitary policy calls for no living species to be found in plant or plant-product shipments, thereby limiting the potential for crop defense. Environmental and exchange policies must therefore be calibrated so as not to place the agricultural product suppliers at a disadvantage. This would be contrary to the goals of the CAP which would simply export this harm to the environment[9].

### **3.2 Soil Management and fertility:**

Soil is the base of life over this green planet and is major component of the vital zone of the earth. Provides essential resources for food productivity, biodiversity, growth of plants, animal protection, carbon sequestration and maintaining the sustainability of the environment. It is proved now that soil is the main factor behind the terrestrial carbon pool as well as major contributor to greenhouse gases, thus a favorable step can be initiated for reducing the climatic problem through sustainable land management activities. One option is to increase the levels of organic carbon and humidity in the soil particularly with the carbon recalcitrant types (biochar application). In general, soil quality is dictated largely by behavior of the farmers along with the other influencing factors as increased modernization may deplete the upper fertile layer of the soil and adulterate it with unfair components as industrial chemicals, cement, plastics which significantly affects soil's reproducibility [10].

### **3.3 Sustainable resource management:**

With the present rate of expanding world's population, more initiative and ingenuity will be desperately required for achieving sustainable increase in productivity, strengthen global food supply chain, reduce the food waste and to ensure the access of nutritious food to all those who are suffering from hunger and malnutrition. In the conference on sustainable development (Rio+20) in 2012, many of the world leaders reaffirmed the right of everyone to have access to healthy and nutritious food, in line with the right to sufficient food and the universal right of everyone to be free from hunger. The United Nations (UN) secretary-'zero hunger challenge' initiated in year 2012 in Rio+20 conference and called on states, civil societies, religious groups, private sectors and academic organizations to mobilize, with the aim to end hunger and eradicate any form of malnutrition. The sustainable development goal was addressed in 2015 by United Nations General assembly, to end hunger, ensure food security, good health and well being, promote sustainable agriculture and recognize inter relationships between supporting sustainable agriculture, promoting gender equality, addressing climate change, empowering smallholder farmers, ending rural poverty, ensuring healthy lifestyles and other related issues [11].

### **3.4 Energy Efficiency:**

Agriculture is the most important fields to control the global economy. Energy sources are required at several points in the agriculture as: from the manufacture and application of pesticides to the fuelling of tractors which plant seeds, harvesting the crops and need of electricity for animal housing. This large energy requirement has left farmers to be exposed to high energy prices and unpredictable energy demand volatility. It has also effected on fertilizer costs. If applied successfully, energy efficient policies will help the agriculture producers to conserve energy without damaging production. Effective policies may help to achieve the target by imparting education about the highly efficient energy technology, which will allow farmers to improve their activities [12].

### **3.5 Pollution control:**

Agriculture waste management needs proper attention to convert waste into useful product and also to avoid any type of pollution caused by them. For instance, the stubble burning by farmers is known to be one of the key

causes for the decline in air quality and smog before the winter season in many Asian countries. Aside from the possible risks of chemicals/pesticides used for agriculture purpose, the other related industrial waste may damage the environment. Animal agriculture, for example, can emit harmful contaminants. Agricultural wastes includes any kind of excesses, residues of the growing crops and also includes the processing remains of raw agricultural products, such as vegetables, fruits, fish, goat, meat, poultry and dairy products [13]. The agriculture industry produces several kind of wastes like:

1. Green waste
2. Bio bed waste
3. Waste silage
4. Pesticides
5. Fertilizers bags
6. Veterinary products generated waste
7. Waste medical containers/equipments
8. Waste oil etc.

A sensible waste management includes the experienced handling of all types of waste product which any farm industry produces [14]. The professional management ensures that the farm work fully support the safety regulations for farm waste disposal and provides all essential equipments and containers which are required to store the waste safely till the final settlement. Thus, it is of extreme importance to dispose all these wastes in a prudent manner to avoid any kind of harmful effect.

### **3.6 Animal Husbandry:**

Livestock played an invaluable part in the economy of India. Animal husbandry is culturally and socially rooted in Indian society. Livestocks are source of animal based protein and very highly demanded. To fulfill this dietary requirement, many companies are involved in these businesses since years for providing variety of livestocks such as: apiculture, sericulture and pisciculture. Indigenous stocks are more immune to viruses and are better able to respond towards climatic change. They serve as a shield against crop failure and unexpected monetary losses. In India, large range of livestock are available as, yaks, camels, pigs, horses, sheep and goats. But technological backwardness, inadequate veterinary services and financial constraints are the few issues which hinders progress in this sector [15].

### **3.7 Marketing:**

Agriculture is the main activity in India. Much of India's population still remains in rural areas and agriculture and its allied operations are the primary source of revenue. However, amid the numerous efforts of the government, there is still a difference between the investment made by the farmer and the return on the investment made. Therefore, the lack of facilities, costs, lack of transport, unequal practices have influencing dimensions effect on the attitude of farmers towards agricultural marketing [16]. Agricultural marketing is a process that begins with the decision to produce a commercial agricultural commodity which involves various aspects of market structure, both financial and institutional and on the basis of technical and economic considerations (also includes pre-and post-harvest operations) assembling, grading, storage, transport and distribution [17]. The production and marketing strategies for an agricultural produce is interlinked in such a way that brings convergence of many schemes and resources to explore the collaborative efforts for the benefit of farmers. Many government strategies are focused toward this as in India 'National Institute of Agriculture Extension Management' an autonomous institution under Ministry of Agriculture works on this platform to support farmers by formulating the basic guidelines regarding the marketing plans in stepwise manner as:

1. Interaction between Agriculture & Marketing Department
2. Core Team Formation
3. Orientation of Core Team
4. Data Collection for the Marketing Component
5. Analysis & Consolidation of the data

As a first step, cooperation between the agriculture department and marketing department of the government organization should occur in order to integrate marketing plans. The inclusion of the marketing plan in the policies has the potential to significantly boost the preparation operation of the marketing department itself, as the marketing plan can be planned in accordance with the district's production trend. This strategy would also be very useful and practical for the marketing department in providing the appropriate market connection to the production of various agricultural products at the district level. At the next step, the agencies related to agriculture, animal husbandry, sericulture, horticulture, dairy development, marketing, soil conservation, fisheries, irrigation, forest and other non-government organizations (NGO) working in the district will form the district's core team. Scientists from Agricultural Universities, Krishi Vigyan Kendra and zonal research stations and the NGOs working in the district will form the district's core team. This core team must be sensitized on various aspects of marketing for which formats and schedules have been developed. The team should make others aware of the marketing practices prevalent in the district, including controlled marketing and contract farming, direct selling, retail chain convergence, manufacturing, processing and export of agriculture produce along with other things. Under the data collection work, the sample farmers is being chosen whom should be able to provide information on various forms of agricultural marketing such as contract farming, direct marketing, futures markets, and so on. The data must be obtained using the schedules (Part-I) and formats (Part-II) produced by various stakeholders on various aspects. The schedules will aid in identifying loop holes in the structure and the causes of those gaps. This will also aid in the development of future plans for various sub-components of a district's marketing strategy. The holes and solutions must be listed in the corresponding columns of the final drafts that will be used in the database. The review of the data obtained through this survey should be used to plan a large marketing scenario for the district in conjunction with the production trend, crop diversification with special emphasis on the future prospective[18].

### **3.8 Wildlife and Landscape management:**

Approaches to integrated landscape management are now gaining new attention as scientists, decision makers and local residents realize the need to increase the multi-functionality of agricultural environments for food production, enhancement of livelihoods and protection of ecosystems. Whole ecosystem cannot be disturbed for momentary benefit of human race because this is not one day goal to eradicate forest and convert the land use. Finally, these change would lead towards detrimental results by affecting the whole humanity, in form of drastic climatic changes caused by the disturbance in whole ecosystem. There is an increased and regular contest nexus in between the biodiversity, economic developmental issues, ecosystem conservation and agriculture which is clearly evident in the strategies and policies of many world countries like Latin America and others [19]. Thus, in many parts of the world, new methods are being attempted to systematically determine the properties, results and shortcomings for wildlife and landscape management [17].

### **3.9 Organization planning and risk management:**

Most of the human necessities and requirement are based on agricultural product. Thus agriculture has emerged as a big business which needs proper planning in organized way to fulfill the increasing demand of the society with the proper coverage of the farmer produce, to protect him from the multiple adverting factors involves till the sale of the harvest. This domain of agriculture management applies holistic approach which considers interactions among all the sources of risk, policies and farmer's strategies. In Canada, the policy analysis is organized around three layers of risk that demand a distinct policy response: common or frequent risks that should be maintained by farmers, marketable intermediate risks that can be transferred by market tools, and catastrophic risks that require government assistance[20]. In Indian context, Niti Aayog recognizes many kinds of risks involved in agriculture. For example technology risk, production risk, institutional risk, price and market risk, personal risk, financial and credit risk.

Indian risk management strategies are based on the Global Development Report (World Bank 2001) which defines solutions as "agreements affecting individuals or households or groups such as societies or settlements". It also has been defined as ex anti and ex post designation which depends on time at which the danger reaction happens: as before occurrence of possible harming event is known as ex anti and after occurrence of the incident

is called as ex post. This is also useful in illustrating the differences between risk-sharing strategies and on farm strategies between the ex ante reactions[21].

Ex anti-informal policies are distinguished by the diversification of sources of income and the option of agricultural development strategies. One tactic that can be used by producers is simply to avoid risk. In certain situations, extreme poverty places individuals at extremely high risk, often avoiding risk-based behaviors that may also lead to higher income increases. Crop-sharing agreements for land rental and labor hire also offers an efficient way to share risks between individuals, hence it reduces risk for producer. Other risk sharing mechanism are, community-level risk pooling exists in individual groups or in expanded households where the members of population pass services to one another to balance marginal utilities. Such arrangements are useful in counterbalancing the effects of incidents that impact certain individuals but incapable of analyzing the cases of income raised by covariate shocks.

Informal ex post income smoothing strategies usually involves selling of the properties, such as cattles, reallocating the labor capital with off-farm operations, deferred key family roles, decreased patterns of use, relocation. Studies have shown that south Indian farmers have enabled themselves to shift rapidly from total farm labor to predominantly off-farm practices if monsoon rainfall is predicted to be low. Whereas several studies conducted in India clearly report that major productivity loss are associated with the risk factor, because of the lack of proper specialization. In other words, farmers can be enabled to exchange their income fluctuations with a reasonable profitability.

Agricultural management strategy applies a systemic approach that addresses relationships between all sources, risks, farmer strategies and policies. The policy analysis is built around three layers of risk that demand a distinct policy response: frequent risks, intermediate risks and catastrophic risks. The concept of the proper balance in various layers and the assessment of all the probable factors affecting agriculture and its output is covered under the agriculture management. It's a cumbersome job for a farmer to consider all the factors hence the need of 'Agriculture Manager' arises. Agricultural managers organize and oversee the operation of plantations, greenhouses, nurseries and other agricultural processing facilities. In broader term, farmers may often be hired and trained to take care of farm produce under their specialized supervision.

Agricultural managers oversee all facets of operating fields and other plants producing vegetables. Other responsibilities include preparation, supervision and occasionally participation in plantation, fertilization or harvesting process. They may recruit, educate and oversee farm employees to ensure that they are well trained for their important positions. An agricultural manager oversee and execute numerous operations on plantations, nurseries, greenhouses and other agricultural production sites. They also manage the accounts, support and select proper equipment's for the farm. This role is extremely critical for the preservation of the food supplies of the country. Many of them are self-employed and participate in different aspects of farm management. Others who work in large industrial farms may assemble and lead a team for their specialized tasks. While there is no essential requirement of educational qualifications, a degrees in agricultural sciences, botany or other related fields like biotechnology are becoming the industry standards to hire them for their knowledge and expertise in agriculture science.

## **Conclusion And Implication**

Agribusiness management, a discipline which blends economics, agriculture, commerce, business administration and other management principles. For a properly managed agribusiness, attention is required from the very initial phase, right from the plantation of seed until getting the actual reward in form of adequate market value of the harvest. These issues can be well addressed by management related education in agricultural which certainly incorporates hidden potential of creating a second wave for agricultural revolution [22]. Which enhances the role and responsibilities of an 'agriculture manger', especially in developing countries like India

where the economy is based on agriculture hence called as Agrarian economy. These manager not only provides their specialized opinion based on the current technology and available data but also do all the paper work which might be a big task for a poor illiterate farmer. They are well versed with the government plans, aids and benefits for farmers, thus they give agriculture a new dimension which was never explored earlier. In the recent time, most of the world countries are employing Agriculture manager who pursues a career in agriculture to oversee all aspects of running farm lands and other facilities to produce crops and benefit agriculture with their specialized knowledge. On the one hand it's benefitting the agriculture and on the other side it is providing lucrative opportunities to the young generation by providing them a suitable employment. As a result, it's a position which provides a win-win situation to the country like India where more than 40% of population is dependent on the agriculture for their employment [23].

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