Abstract—Agriculture is one of the single largest sectors of Bangladesh economy. Bangladesh is an agro based country and predominantly is an agrarian economy. It is the backbone of the economy of Bangladesh. Around 75% of the total population directly or indirectly depends on agriculture and near about 84% of the total population lives in rural areas almost depend on agriculture for livelihood. Agriculture includes the sub-sectors of crop, livestock, forestry and fisheries. The contribution of all sub sectors is around 22.83 percent to national GDP in 2003-2004. The crops sub sector alone contributes 12.94 percent of GDP.

Keywords—Agricultural Governance

I. INTRODUCTION

BANGLADESH rich in its agricultural environment and development. There are various traditional varieties in the country. With the passage of time and socio economic demands, some high yielding varieties has been cultivating in the country to achieve food security. To fulfill the food and nutritional demand of the growing population of the country and to ensure food security, special emphasis has been laid on building up modern agricultural systems based on appropriate technology. As about 80% of our population lives in the rural areas, relying mainly on agriculture for their survival; the sector plays a pivotal role in alleviation of poverty and sustainable economic development. But this sector is very much implicated with problems that are main obstacles to the development of the agriculture. Pesticides are chemically produced and used as poisonous for killing the insects in agriculture. It is all over the world and it is used restrictedly. Hundreds of crust species has been extinguished due to misuse of pesticides. This alone awaken us to the dangers of the use of uncontrolled pesticides and chemicals, but few seem to be concerned enough to try to stop this form of poisoning. The world Health Organization issued figure showing that pesticides poison 25 million people every year and that more than 220,000 die from exposure to these chemicals. In Bangladesh, this chemical are using normally, thought it has certain rules of using the Bangladesh government has encouraged many others, for years now and only recently has to come to understand the extent of the health and threat due to over-use or wrong use. In problem lies in the fact that, if hazardous pesticides and chemicals line parathion or DDT for that matter — are allowed to pollute the environment with abandon, the health of us all is at risk as they have the potential to cause irreparable harm.

In the modern agriculture, it is essential to use the pesticides for agriculture. There is a great effect on the biodiversity.

Various types of fishes, plants, and species have been extinguished. As a result, the balance of bio-diversity has been affected. Besides this, chemicals upon mixing with the water in the ponds, paddy, field, hoard & boar, drainage, canals, river and pollute it seriously. Consequently, the living beings of that area are alarmingly hampered giving birth to various diseases. A pesticide not only destroys the harmful pesticides but useful pesticides as well, imposing serious negative impact on the bio-diversity.

New Agricultural Extension Policy was felt since the early nineties as part of governmental responsibilities to stipulate policies and regulations that would ensure sustained agricultural production. A Task Force was then formed headed by the Secretary of Ministry of Agriculture for developing a New Agriculture Extension Policy [1]. It comprised of representatives from the public and the private sectors as well as the non-government organizations. Experience and expertise of all three parties were fully utilized in preparing a draft policy. The draft policy was circulated among individuals, organizations and experts for comments and the New Agricultural Extension Policy was finally approved by the government in July 1996 and some agricultural laws such as the Canals Act, 1864; the Irrigation Act, 1876; the Agricultural and Sanitary Improvement Act, 1920; the Tanks Improvement Act, 1939; The Bangladesh Irrigation Water Rate Ordinance, 1983; the Destructive Insects and Pest Act, 1914; the Agricultural Pests Ordinance, 1962; the Agriculture Pesticides Ordinance, 1971; the Seeds Ordinance, 1977; the Agricultural Development Corporation Ordinance, 1961; the Bangladesh Rice Research Institute Act, 1973; the Embankment and Drainage Act, 1952., have been passed to develop and conserve the agriculture environment in Bangladesh. It is also mentioned here that the government has taken many steps in this regard. It is a matter of great pleasure that the country has attained food sufficiency in the country. Besides, the government should take some initiative by observing the rules and regulation of the developed country. These laws have been applied in the agricultural environment and development in Bangladesh.

II. BACKGROUND

Agriculture is the largest sector in the Bangladesh economy. Its combined contribution (crops, forestry, fisheries and livestock) to the country’s GDP and employment was 32 percent and 64 percent respectively in (1995-96). Around 27 percent of country’s exports in 1995-96 comprised of agricultural and agro based commodities with primary products accounting for half of the sub-total. Growth rate of agriculture in (1996-97) was a phenomenal 6% which propelled the annual GDP growth rate to 5.7%, a record in the nineties (BBS, 2000). As about 80% of our population lives in the rural areas, relying mainly on agriculture for their survival,
the sector plays a pivotal role in alleviation of poverty and sustainable economic development [2]. But this sector is very much implicated with problems that are main obstacles to the development of the agriculture. Pesticides are chemically produced and used as poisonous for killing the insects in agriculture. It is all over the world and it is used restrictedly. Hundreds of crust species has been extinguished due to misused of pesticides. This alone should awaken us to the dangers of the use of uncontrolled pesticides and chemicals, but few seem to be concerned enough to try to stop this form of poisoning. The world Health Organization (WHO) issued figure showing that pesticides poison 25 million people every year and that more than 220,000 die from exposure to these chemicals [3].

III. RESULTS AND DISCUSSION

In order to maintain the agricultural sustainability, we need to follow the pollution prevention policy as mentioned in the Australian Conservation Foundation known as ACF [4]. This organization believes that all species have the right to unpolluted air, water and soils, in order to maintain the health of ecosystems including the agricultural ecosystems in Bangladesh (ACF, 2011). In fact, the impacts of pollution has an ability of the environment to sustain itself in the long and short term; the health of species and ecosystems, including humans; and the aesthetic (i.e. visual olfactory and aural) quality of the environment. In terms of the holistic approach to pollution prevention must consider the interrelationships between biological systems and air, water and soils. Pollution of one medium cannot be viewed in isolation from the other media. For examples acid rain pollution affects species and ecosystems, water quality, air quality and soils. A precautionary approach should apply to pollution prevention, so that when doubt exist about the impact of a particular substance on the environment or on human health, policy and practice should be framed on the basis of ensuring safety rather than risk significant and possibly irreversible damages. In order to prevent the pollution in agriculture in Bangladesh, we need to follow the procedure as made by the ACF and they believe that no single mechanism will stop the production of pollution. A variety of different mechanisms should be used to encourage and enforce pollution prevention. The different mechanisms should be complementary, addressing a range of problems associated with pollution generation. These include changes to production processes, legislation, financial incentives and disincentives, research, changes in consumer habits, education and research. The mechanism used should be appropriate to the political and industrial history and culture of the community to ensure that their administration, implementation and enforcement are optimal. This is not to say that we should be limited in any way to existing regulatory mechanisms.

IV. THE POLLUTION SOURCE MECHANISMS

It is the best prevention principles by which we can easily stop the pollution in any kinds such as agriculture, fisheries etc. We need to control and stop the input of resources to the production process and the design of production processes, not end of the process control. It can also include (a) new technologies, regular updating of technology and regular maintenance; the Product substitution - replace the toxic material in products with a non polluting alternative, for example water based paints instead of solvent based paints; Input substitution - alter input to generate less hazardous waste and the Source segregation - isolating different types of waste and residue instead of combining all waste, enables easier reuse and recycling. (b) The use of end-of-pipe pollution controls such as filters and scrubbers may not prevent pollution but simply vary the medium by which it enters the environment. For example when filters are cleaned or discarded the polluting substances caught in the filter can be released into sewers or landfill. This should be prevented (c) Waste minimization is a key aspect of pollution prevention. Waste minimization required the efficient use of natural resources and energy. To maximize resource use efficiency and waste minimization, products and processes should be designed for long life use, re-usability, recyclability and environmentally safe disposal. These issues may be implemented and executed with the help of the Bangladesh Environmental Conservation Act 1995.

V. WATER RESOURCE SCARCITY AND ELECTRICITY SUPPLY PROBLEMS

At present, the irrigation systems in Bangladesh have been facing enormous problems due to lack of insufficient electricity and it has become a threat to the agricultural development in Bangladesh. The authority quite failed to produce adequate electricity for irrigation. The farmers and the stakeholders are quite dissatisfied with it and sufficient productions are not made which is not desirable from the agriculture industry in Bangladesh.

VI. GREEN REVOLUTION AND TRADITIONAL VARIETIES

About the end of the 16th century, the green revolution began and the trough this processes the Monoculture, High yielding varieties & hybrids seeds began with it. The Biodiversities are destroying by it and the farmers are depending on chemical materials day by day. A lot of shallow and deep tube well is lifting water for the irrigation. As result, the lyre of the water has been downed widely. Green revolution was made in 1960s as an initiative of modernizing agriculture and maximizing agricultural growth in order to alleviate poverty of the country. That is why, some important measures such as modernizing agricultural technology, introduction of high yielding varieties of crops, intensification of crops, introduction of chemical fertilizer, etc., have been made to achieve the target. There are some external outputs were made such as the decline of the traditional varieties were identified. We need to rethink about this replacement for our agricultural sustainability.

VII. THE ROLE ICT AND TECHNOLOGY TRANSFER

The agriculture in Bangladesh is not adequately developed with the modern technology facilities. That’s why; the proper benefits and income generations are not properly done. The impacts of the ICT on the agricultural filed are not properly realized. It is said that the present age is an age of science and
technology. Whatever, we perceive we see science in it. But it is a matter of great regret that the use of modern technology is almost absent in agriculture. If the peasants of the country utilize the modern technology the country can achieve much progress. The government has taken many steps to meet the present need of the country especially from the year 1960. The government has set up BADC to conduct the agriculture sector in Bangladesh. Consequently, Bangladesh now achieved food self-sufficiency because of these facilities. These facilities should be enhanced to a large extend for the sake of the agriculture in the country. We need to implement the ICT policy and laws in Bangladesh for agricultural development. It promotes the service delivery and productivity in our agriculture sector in Bangladesh [6]. In the age of globalization, we need to revise our agriculture sector with ICT for better human rights and service delivery issues in Bangladesh [7].

VIII. GOOD GOVERNANCE ISSUES

The meaning of good governance in a true sense is hardly practiced in the agricultural administration and development in Bangladesh. The agricultural governance in a true sense is hardly applied due to bureaucracy problems. In order to promote the good governance in agriculture, the reforms issue as made in the 70s to 90s may be discussed. Furthermore, good governance is also essential to achieve the MDG’s goals for Bangladesh.

IX. INADEQUACY IN RESEARCH AND INNOVATION

In terms of research activities and its implementations are not satisfactorily made, although there are some specialized universities on agriculture in Bangladesh. The pragmatic knowledge of using HYV cultural practices of the farmers or related personnel should be given. They should not be misleading to use of it. Besides, adequate research on these vital issues of varietals up gradation is being rarely done by some of the institutes and organizations [12].

X. INADEQUATE PENAL PROVISIONS

It is identified that a lot of agricultural laws implemented in Bangladesh for agricultural development and environment. But unfortunately, most of the laws are scattered in nature and its penal provisions are quite inadequate to the present socio economic change of the country. These laws are quite British colonial authorities. Before independence in 1971, around seventeen Acts were passed in1757-1971 during the British period, but only three (3) Acts were passed after independence of Bangladesh. In this regard, the Constitution of Bangladesh has clearly made about the agricultural governance and practices. It directs that all discriminations and inequalities between the rural and urban must be eliminated and all possible initiatives and steps must be taken for agricultural and environmental development [8].

XI. AGRICULTURE POLICY AND ACTION PLAN

Bangladesh is predominantly an agro-based country. So the development of the country almost depends on the development of agriculture. Different Governments of different periods have taken many initiatives to develop agriculture in Bangladesh. For the purposes of developing agriculture, different Governments have prepared and passed different year plans and budgetary allocations such as first five year plan, second five year plan, and fifth five year plan etc. The Government has also formulated many policies in relation to agriculture such as crop policy, 1998, irrigation policy, 1998, national water policy, 1999, agricultural policies, 1992 and agriculture action plan, 1992 and agriculture extension policy, 1997 with the creation of environment policy [9] and environment action plan in Bangladesh. It is admitted in all hands that non-coordination among concern departments is a great concerned. How these agriculture policies, taken by the government in different period for the development of agriculture, will conserve the environmental resources? And how it will minimize the environment problems and pollution especially agro-chemical pollution which resulting fresh water fish degrading in Bangladesh. The answers of these questions are not available in the agriculture policies in Bangladesh. It may be pointed out that the above ingredients of the extension policy and for ensuring the efficiency and productivity of agriculture in Bangladesh, several factors such as rural households farm activities, training facilities, research, group approach participation, information technology, methodology, integrated extension support, proper co-ordination, optimizing the use of resources, supporting extension programs should be given much priorities for agriculture development in Bangladesh. But it should be aware about the implementation of the agriculture extension policies. It is observed that the Government is very much aware about the implementation of the extension policies and at present it is implementing this policy providing training facilities to the farmers, micro-credit etc., in the field but there are some limitations which are earlier cited. It is crying need to implement all the policies including agriculture extension policy. Nothing should be kept in the paper rather it should be carefully implemented. In fact, the Department of Agriculture has taken some important initiatives for promoting agriculture development in Bangladesh. The guideline for the Department of Agriculture (DOA) is almost satisfactory but there are certain limitations. The officers of the DOA are not interested to look into the activities prescribed for them. The monitoring of the local officers will be frequently observed for the purposes of the developing agriculture in Bangladesh. There are no facilities of the field officers mentioned any where of the design of the DOA activities, which may reconsider, for their work. In this regard, there are certain coordinating agencies but there are no guidelines for them in this regard, which could have to insert in the policy. Moreover, political commitment is also essential for the policy implementation in any areas of the government [10].

XII. MORTGAGE SYSTEMS

It is a debatable issue in agricultural governance in Bangladesh. Professor Marshal once stated that “mortgage is an unskilled land management system” in order to ensure their rights, the land reform ordinance, 1984 was passed. But the provisions are not properly implemented. The bargadars always remain in at stake. The bargadars are not interested to supply the requirements of the production. As a result, the production becomes decreasing.
XIII. PRIMITIVE AGRICULTURE SYSTEM

The primitive agriculture system is providing in our country. This system is going on in full swing and it is also a hinder to the progress and development of agriculture in Bangladesh. The technological development in this sector has discovered in the year about 1960 and it has a great impact on the agriculture of the developed countries of the world. They have achieved much progress with the help of it. Besides, the primitive methods of cultivation are still practicing in the country.

XIV. LAND AND USE PATTERNS

The pattern of land use in agriculture makes the soil decline, infertility, and inequality of it and the fragmentation is created. A huge load on the small piece of land is continuing. Besides, the expansion of resistance residence, infrastructure development and rural agricultural industry and commerce are being unplanned manner. As a result, the cultivable land is going beyond the cultivation. It is admitted in all hands that the surface of land was covered with the trees in many years ago. Consequently, the topsoil is to preserve easily. But in fact this process makes the country desertification.

XV. SOME CASE STUDIES

An a part of the empirical investigation on the agricultural governance and environment in Bangladesh, the information discussed here based on the Focus Group Discussion from the various categories of respondents such as Block Supervisors, Farmers, Village Mentors, School Teachers etc; who are well known relating to agriculture environment in Bangladesh. The agricultural environment has been facing numerous environmental problems based on the opinions of the selected respondents as follows:

Unregulated use of chemical fertilizers- The government has enacted laws in using of chemical fertilizers in agriculture. But these rules are not maintained in due process. Often the farmers or the concerned person break the laws prescribed in the Act.

Excessive and unregulated use of pesticides- Pesticide is one of the main inputs for agriculture development. But it is using indiscriminately without observing the rules of the Pesticides Act for which it affects the agriculture environment. Industrial wastage (fertilizer industry, sugarcane industry)- Different types of industrial wastage are thrown into the agriculture field. This wastage often harms the agriculture land.

Natural hazards (floods, droughts, rainfall, and natural calamities). Every year various natural calamities are visited in the agriculture field. As a result, the agriculture paddy field and other natural vegetables and other seasonal crops are often destroyed due to it.

Unscientific and unregulated cultivation- The cultivation is regulated due to indiscriminate ways. Besides, the cultivation of this country is fashioned in the ancient ways, which is a contrary to agriculture development.

Insufficient tree plantation- Bangladesh is not rich in tree plantation. It has an impact on the agriculture development and environment.

Green House Effect- Green House Effect bears negative role in agriculture. It damages in many ways for which the agriculture development is less achieved.

Constraints to Farmers- Unavailability of modern technology, tractor, power driller, power pump spray machines, irrigation pipe, credit facilities, lacking in proper value of paddy, jute, etc, preservation of seeds and other goods, weather climate, natural environment, seasonal rainfall, poverty, lack of agricultural equipment.

Uses of Modern Equipment in Agriculture- At present, the Department of Agriculture has achieved much with the use of modern technology. It has also bears positive and negative impact on agriculture environment and development. Various types of chemical fertilizers and pesticides and fungicides are used in agriculture. A brief discussion relating to agriculture inputs are discussed below.

Types of chemical fertilizers- Nitrogen, phosphorus, sulfur, zinc, etc. It mixes with the water bodies (pond, haor, baor, beel, river water, tube well water, deep tube well water, rain fall, natural calamities etc) and pollutes the environment. Besides, it affects the fisheries environment and different types of fishes have been extinguished.

Types of Pesticides- Dymacron, diozinon, labacida, furadan (Banned). At present effective- Asataf, Dustban, feady, fantox, taugh goor, indofine, babistin, teal, podax, etc. Over doze- The use of pesticides is regulated in the prescribed rules. These rules are to be regulated for the better management of the environment and development in agriculture. The farmers are habituated in using over doze of pesticides in agriculture. Consequently, the agriculture environment is facing various problems.

Untimely delivery- The delivery of different pesticides and fungicides are not due paid. As a result, the consumers are to face numerous problems in agriculture.

No attack of disease in the plants or vegetables but frequently use of pesticides- The farmers are habituated in using pesticides day and night. The ignorant and uneducated person often guides them. They don’t inquiry about the causes of attacking diseases in plants or vegetables. They frequently use this medicine for the plants.

Excessive use of pesticides to the crops- The farmers and the concerned person use pesticides in crop indiscriminately. As a result, different types of diseases are break out in agriculture. Rainfall washes away the pesticides into the water bodies.

Rainfall is one of the main factors of the agriculture development and environment in Bangladesh. The rainfall is often found during the monsoon. But it does not maintain in proper time. It often causes of rainfall in the country.

High power Pesticides- The pesticides are formulated in friendly environment. But it is often made without compliance with the rules of Pesticides, which cause damage to the agriculture environment. The pesticides are made in high power instead of normal formulation. Different type of pesticides on the same crops- Different types of pesticides are
frequently used in the paddy field on the same crops. As a result the crops are damaged and consequently different diseases are broken out in agriculture.

**Frequent use of pesticides** - The pesticides are used in the field repeatedly without understanding of the feasibility of the pesticides. A level of quantity is very high. The concerned persons are used the pesticides in high quantity. Ingredients of the pesticides are not made in the sound manner. Pesticides are made of different ingredients. But these ingredients are not formulated in the scientific ways. Different types of household’s wastage are not kept in the proper places. The household’s activities are not kept in the proper place. As a result these activities are often brought destructive in the agriculture field.

**Chemical fertilizers are used instead of compost manure** - The chemical fertilizers are used instead of compost manure in agriculture in Bangladesh, which affects the environment. Trees are cut up indiscriminately. Trees are made of different ingredients. But these ingredients are not formulated in the scientific ways. Different types of household’s wastage are not kept in the proper places. The household’s activities are not kept in the proper place. As a result these activities are often brought destructive in the agriculture field.

**Different types of Indian pesticides** such as thainal, dioden, hildon, liquid (and) the solid powder like excel-50, etc are used in agriculture, Bangladesh.

**Different indigenous useful insects** like kacho, snake, fish, etc and the injurious insects like foring, mazra, handli, shesh kata, leda pokata are become extinguished due to pesticides. The following information is collected from the pesticides business man, marketing officers involved katakhalia, Rajshahi in a Bazar who are always associated with the pesticides and fungicides in Bangladesh. The government has already banned the following insecticides:

- **Sulfur group** Pillar crane: Azodin; Nova crone; Light Trap (Alor Fad)
- **Soluble** (Danadar Granularkarbofunam group)
- **Furadan**
- **Basudin**
- **Indofil**
- **Rido Mill**
- **Basuta**
- **Furan** etc.

**Objectives** - To keep the environment free from all sorts of diseases to the human body or other animal’s diseases with a view to more production or other animal’s diseases with a view to more production.

**AEZ Agriculture Ecological Zone** - The total land area of Bangladesh are divided or classified into thirty 30 classes such as hilly, rocky, alkali, down, salty, highland, muddy, very low land areas for maintenance of the proper ecosystems.

**Agriculture Extension Policy** - IPM Integrated Pest Management and to keep the environment free from the pollution for maintaining sound and balanced environment without using pesticides, insecticides etc.

**SFFP Soil Fertility and Fertilizer management Project** - Keeping soil fertile, sound soil management, maintaining sound environment from pollution and to keep the environment free from all sorts of diseases to the human body or other animal’s diseases with a view to more production applying modern technology. It is divided or classified into three sub heads such as HYG-(High Yielding Goal); MYG-(Medium/ Moderate Yielding Goal) and the FP-(Farmers Protection).

**The Government’s and NGO’s programs in Agriculture** - The Government’s and NGO’s programs in Agriculture are working. The governments agencies such as Bangladesh Rural Development Program (BRDP), Bangladesh Agricultural Development Corporation (BADC), etc are directly or indirectly involve in the development of agriculture in Bangladesh. The non-governmental organizations such as– Bangladesh Advancement Committee (BRAC), Krisokh Samaby Samity (KSS) are working along with the Government for the improvement of the agriculture extension policy in Bangladesh.
XVI. RECOMMENDATION AND CONCLUSION

From the study above mentioned, it is identified that there are lot of problems in agricultural environment in Bangladesh. In the meantime, the government has taken many steps such as up gradation of the agricultural policy and its related laws. It is a pleasure that the country has attained food sufficiency in the country. The study suggests that the country may consider some principles and actions taken by some developed countries such as Finland, USA, Belgium etc, for our country with agricultural modernizations. It may be concluded that the origin of agriculture is observed with the beginning of the major civilizations of the world. Agriculture also contributed at large to every economy of the world. At the same time, agriculture and environment is entire related. But the present environment of agriculture is degraded due to over population, exploitations of natural resources, over harvesting, non compliance with the existing laws and policy etc. To cope with this situation, the world bodies as well as Bangladesh has taken many measures such as enactment of laws, code of conduct, policies, conferences etc. In this regard, around 20 agricultural laws with a few policies and plans is prevailing in the country and it may be termed as insignificant due to its inadequacy such as limited environmental penal provisions, colonial laws etc. Some substantive and procedural laws such as code of criminal procedure, penal code, constitutional obligations etc. are also undertaken for the conservation and development of the agriculture environment in Bangladesh. But it regrets that the implementation of those laws and policies is not satisfactory and weak in enforcement due to lack of co-ordination, institutional weakness, and influences of local politics, grouping etc.; are the routine work. But at present, the Government is implementing the agriculture extension policies framed in 1996 in the field. The officers of the field level such as Upazilla Officers, District Officers, and Deputy Directors are busy at the implementation of the agriculture extension policies in agriculture of Bangladesh. The Government should make necessary amendments for updating the existing agricultural laws and policies. In addition, the Government should make laws for removing institutional weakness such as lack of co-ordination, increasing manpower, facilities, modern equipments and training on ICT etc. for the sake of the proper implementation of those laws and policies in Bangladesh. The implementation and practices along with the findings of the agricultural research need to be done as soon as possible for the interest of our country.

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