

The Real Green Revolution: Indication of the Future Agriculture of Bangladesh

Abstract

Bangladesh is one of the four most climate change vulnerable countries of the world (IPCC). The monoculture based conventional agriculture in Bangladesh that depends on excessive external inputs including poisonous agrochemicals is facing severe problems in combating the challenges of food security & climate change. **Tanu Integrated Agriculture (TIA) Farm** is a modern model of thousand years' old traditional & sustainable farming system of the country that could be an alternative of conventional agriculture in this regards. The farm is located in the village named Arajipalashbari at the bank of the dying river Dharala only 2.5 km away from the centre of the Kurigram town one of the districts of Bangladesh which is well-known as Manga (seasonal famine) affected area of the country. The widespread diversity of the farm in terms of both components and varieties or species of plants and crops is the key strategy for adaptation to climate change and food security. The major components of the farm include Plantation of more than 4000 trees of more than 40 species of local timber trees, 3650 trees of almost all kinds of local fruits, 29 kinds of medicinal plants, fish culture of local species in three ponds, 16 cows and calves mainly of local species, vegetables, spices and other food & cash crops. The farmer has already invested BDT.18,08,000 in this farm though some more components viz. local chicken & pigeon, rice-fish-duck culture, biogas plant, food processing, processing of medicinal plants, honey bee culture etc. are yet to develop. It was calculated that during the year 2011 the total expenditure of the farm was BDT.6,80,900 and the income was BDT.8,17,000 getting a net profit of BDT.1,36,100. It was also calculated that the present valuation of the farm would be BDT.83,06,000 which would be increased up to at least BDT.125,80,000 and BDT.168,25,000 after five and ten years respectively. Moreover, the farm has significant contribution in creating year-round employment for the Manga affected people of the area. At present 7 permanent labours of the farm have guaranteed works throughout the year while other temporary labours have at least 200 man-days works during pick seasons that has been contributing a lot in mitigating Manga of this area. The consumers are getting fresh & safe foods like fruits, vegetables, fish and others foods throughout the year at a reasonable price from this farm. Climate change induced disasters like flood, drought etc. don't affect the farm very much because of its planned structure and wide diversity. The availability of birds including the pests & beneficial birds and insects has significantly been increased in the farm indicating revival of destructed ecosystem of the country. Soil condition has been improved and the biodiversity has been revived. Moreover, huge plantation should have positive impact on environment as well as climate change mitigation.

Introduction

The world leaders seems to be at a loss in combating the challenges of food security & climate change especially in the country like Bangladesh which is one of the four most climate vulnerable countries in the world. Now, the modern technologists are prescribing technical solutions by introducing hybrid & GM crops in order to combat the challenges of food security & climate change inviting corporations to take over the control of agriculture from the grip of farmers. It is true that technological interventions are necessary for increasing the productivity of our agriculture. But, by last four or five decades it has been proven that the green revolution technologies neither benefited the majority poor farmers nor produced safe and nutritious food which is essential for food security. Moreover, it is proven in the agriculture of America and Europe that the farmers are getting only one penny out of ten pennies generated from the modern agriculture. This is the right time to raise the questions "agriculture for whom? food security for whom? and development for whom?" If we really prioritize the development need of the farmers who are feeding the whole people of the world we have no other way but reforming our existing agricultural production & marketing system.

Our agricultural production system was an integrated system for thousands of years. Fish, poultry, livestock, timber & medicinal plants, fruits cum timber trees, varieties of vegetables & food crops as well as cash crops were part & parcel of our integrated farming system. Unfortunately, our policy makers termed it unproductive subsistence farming and replaced it with monoculture based agriculture without considering the ecosystem, environment, biodiversity as well as our own culture. We have done all these because we believed that there are no alternative but adapting alien technologies to feed the nation. As a result, Bangladesh is literally developing while the gap between rich & poor equally increasing. We are focusing more on increasing purchasing power to ensure food security where the rich consume irrationally much higher than they need while the majority people go hungry. However, the matter of hope that we haven't lost everything, still there is alternative. **Tanu Integrated Agriculture (TIA) Farm** could be a model for the policy makers as well as for the farmers to

decide what should be the future of our agriculture in combating the challenges of food security and climate change.

The Location of the Farm & the Farmer

The farm is located in the village named Arajipalashbari at the bank of the dying river Dharala only 2.5 km away from the centre of the Kurigram town one of the districts of Bangladesh. The area is well-known as Manga (one kind of famine) affected area of the country where the people don't have food & livelihood security. Very low productivity of soil, flash flood & drought are the common phenomenon of the area along with monoculture of seasonal crops like potato, maize etc. the people don't have works throughout the year resulting in Manga. Massive actions are taken by the government as well as different NGOs to combat Manga in this area and have significant success at least ensuring availability of food and increasing income of the people mainly through different service delivery programs including social safety-net but sustainability of the programs is questionable. Still today almost no education, very poor health & hygienic situation prevail in the area along with high rate of population growth, child marriage, dowry, violence against women etc.

Khandakar Musaddek Al-Mamun who was graduated from Bangladesh Agricultural University in 1998 established the integrated farm in 14.43 acres of land during the period of 2005 to 2011 struggling against huge of socio-economic and cultural barriers. When monoculture has become a trend in agriculture of the country patronized by the government policies Mamun started his integrated farm against the mainstream. As an agricultural technocrat he realized that integrated farming is a must for his survival & sustainability as a farmer. He had many examples in front of him that many farmers specially the modern farmers making huge profit out of their monoculture of fruits, fish, poultry, livestock, maize, potato or other crops. But, he found that this trend is not sustainable because such farming may give huge profit for few people for short term but for sustainability in long term integration is a must. Moreover, he observed that the consumers prefer local fishes, seasonal traditional fruits, and local poultry than the alien species. He also realized that if integration is possible the local components could be more profitable in a sustainable manner.

Major components of the Farm

Plantation: When the other farmers of the area have planted very few species of trees like Eucalyptus and Acacia even in the crop land then Mamun have planted more than 4000 trees of more than 40 species of local timber trees including neem & bamboo as two major items.

Fruit Gardening: When the other farmers replacing the traditional fruit trees by fast growing timber trees like Eucalyptus and Acacia in the homestead as well as going for monoculture of fruits like BAUKUL, Applekul for making huge money within very short time even in the crop field occupying very scarce land of the country for producing food crops then Mamun have planted about 3650 trees of almost all kinds of local fruits ensuring year round supply of fresh fruits. Mamun has conserved the diversity as a strategy to combat the challenge of climate change in one hand and to fulfill the consumers' demand throughout the year on the other.

Medicinal Plants: At present there are 29 kinds of medicinal plants in the farm including Neem, Amlaki, Hartaki, Bohera, Arjun, Tulsi etc. Mamun has a plan to go for commercial production of medicinal plants in his farm in future.

Fish farming: When the present trend of fish culture is based on monoculture of few exotic fish varieties like Telapia, Pangus occupying the crop lands by digging ponds and based on huge amount of external artificial feeds which is not sustainable for the farmers though very few people like big investors as well as the feed corporations are making huge money out of that. But, Mamun don't follow that because such fish culture needs huge investment but the return is very much uncertain due to changing climate as well as other associated risks. On the contrary, Mamun has set such an example of the pattern of ponds for traditional fish culture in a profitable way. The return from his fish culture is increasing day by day because he is using farm byproducts like cow dung, mustard oil cake etc. as fish feed.

Livestock: Livestock is another integral part of an integrated farm not only for the profitability but also to supply cow dung which is necessary food for plants & fishes. At present there are 16 cows and calves in the farm mainly of local species along with few cross breed which are best adapted to our own climatic condition. He has a plan to install local poultry & pigeon soon.

Vegetables: When the other farmers remain in very much vulnerable position with their vegetables in getting profit out of their huge investment as well as risks from unfavourable climatic condition then vulnerability of the farmer Mamun remains minimum due mainly to his integration. He also cultivates vegetables at his pond sides in trellis from where he gets considerable amount of profit without investing much.

Spices: The farmer Mamun also cultivates spices like Onion, Garlic, Turmeric is a planned way following proper technologies & timing and makes good profit.

Other Field Crops: Farmer Mamun also produces different crops in his farm. At present due to his limited land and money for investment he only produces few selected crops at a very small scale. This year he cultivated Jute, Lentil, Rice, and Mustard in his field mainly for own family consumption and getting byproducts for his farm.

Income-expenditure and Profitability

It is very difficult to calculate the economic profitability of such an integrated farm mainly because of integrations of the components with each other. It is to mention here that the farm is still in growing stage and partial return has started to come only since 2009. He has already invested BDT.18,08,000 in this farm though many items yet to develop. During the year 2011 the total expenditure of the farm was BDT.6,80,900 and the income was BDT.8,17,000 getting a net profit of BDT.1,36,100. In terms of economic scale the profit seems to be negligible but the ultimate returns of an integrated agricultural farm must be calculated as a long term basis in an integrated manner.

It is obvious that the farms is going to be huge profitable in the long run that also indicates the sustainability of the farm. The land of the farm was purchased only with BDT.560,000 during the period of 2000 to 2010. Only within very short time the present value of the land would be at least BDT.120,00,000 due mainly to increasing productivity of the land. After only five years the value of the land is expected to be BDT.150,00,000 and after 10 years it should be BDT.180,00,000. However, considering the other fixed items only including timber trees, cows & goats it was calculated that the present value of the farm would be BDT.83,06,000 which would be increased up to at least BDT.125,80,000 and BDT.168,25,000 after five and ten years respectively.

The Marketing system

The existing marketing system is one of the biggest hindrances for the farmers because they are not getting profitable price of their products that retards their economic development. The fact is that the middlemen are grasping almost whole profit generated from agriculture. However, the present market system doesn't affect Mamun much because of his proper planning and controlling over the middlemen because of his consumer linkage from where both he and the consumers are being benefited and satisfied. His wife is playing important role in community marketing because the women of surrounding families give order to her for different farm products.

Impacts of the Farm

Employment generation: At present 7 permanent labours of the farm have guaranteed works throughout the year while other temporary labours have at least 200 man-days works during pick seasons that has been contributing a lot in mitigating Manga of this area. Moreover, most of the money he invested in his farm created works for many of the Manga affected people of the area throughout the year that helped to maintain their livelihoods.

Technology Transfer: This farm has become as a source of information & modern technologies for the surrounding farmers.

Food security: The consumers are getting fresh & safe foods like fruits, vegetables, fish and others foods throughout the year at a reasonable price from this farm.

Climate Change Adaptation: Climate change induced disasters like flood, drought etc. don't affect the farm very much because of its planned structure and wide diversity. If the climatic condition becomes disfavoured for one item it becomes favourable for other items as well that minimizes his loss.

Ecological Impacts: The availability of birds including the pests & beneficial birds and insects have significantly been increased in the farm indicating revival of destructed ecosystem of the country.

Environmental Impacts: Soil condition has been improved and the biodiversity has been revived. Moreover, huge plantation should have positive impact on environment as well as climate change mitigation.

Social impacts: Very good social relationship has been established among Mamun & surrounding farmers who love & trust him and he also loves all. The surrounding farmers also come to him for technical advices. It may be termed as a collective farm of love. The community marketing has also increased social relationship.

Cultural Impacts: Although it is difficult to measure the cultural impact but in general sense this farm would be a model of cultural integrity, family bondage etc. within the society.

Gender: At present six male including Mamun & four female workers permanently working in the farm as a family. Although the women are getting less payment due mainly to existing wage system but they have guaranteed works here throughout the year to maintain their own families.

Recognition so far

The farm has been emerged as a surprise for the surrounding people as it is being termed as a ‘green revolution in a char land’ where farming is very much difficult. Now the farm has drawn attention of the media as well as researchers. Local & national print and electronic media have already covered story on the farm. One of the media has termed the farm as “Green Revolution in Char”. Recently, Dr. M. A. Rahim, professor of Bangladesh Agricultural University along with few of his colleagues visited the farm and recognized it as an extraordinary work. Recently Mamun has been awarded as ‘Local Food Hero’ by Campaign for Sustainable Rural Livelihood (CSRL) for his contribution to food security and climate change in this area.

Future plan

The farm hasn’t got its complete shape yet. Mamun has a plan to include some more components like commercial culture of indigenous poultry, commercial vegetables production with preservation & processing system, fish-duck mix culture, commercial production, processing & marketing of medicinal plants, honey production, establish food processing & marketing system and outlet, establish a biogas plant, adapt modern organic farming technologies etc. by turns.

Concluding remarks

Although it is an individual initiative it has become an alternative model of the monoculture based modern agriculture. If the government come forward to establish it as a social model and take initiative to replicate it throughout the country then it will not only be possible to combat the challenge of food security and climate change of the country but also the government’s efforts of poverty alleviation through “agriculture & rural development” will come true in near future.

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