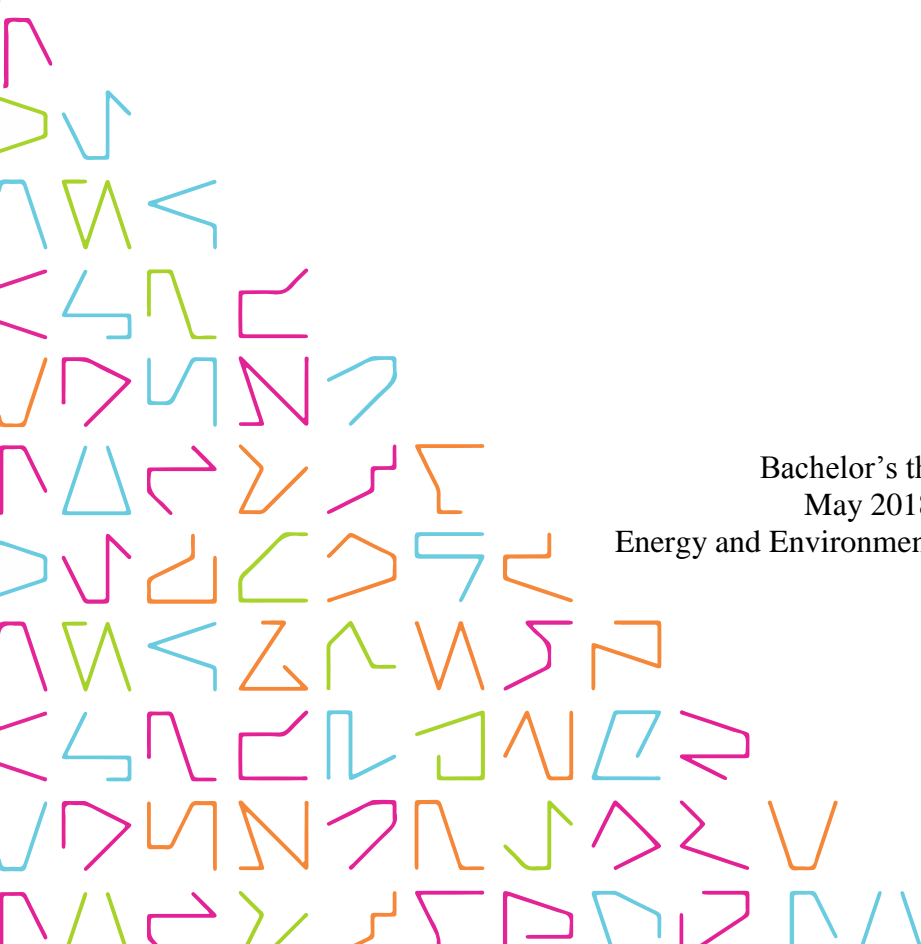


PROSPECTS AND CHALLENGES OF ORGANIC FARMING IN RAJSHAHI DIVISION, BANGLADESH

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ABSTRACT

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The main objective of this study was to gather information about the prospects and challenges of organic farming in Rajshahi division, Bangladesh, which is one of the commercialised divisions with excellent road, communication, water supply and transport infrastructure. The method used was qualitative research based mainly on data and information collected from the internet. The data sources were journals describing case studies as well as reports from official websites of Bangladesh. Additionally, interviews were taken from the thesis assigner itself, from a person of local NGO and from some people of Rajshahi division, Bangladesh.

Based on data analysis, prospects and challenges of organic farming in the studied area were assessed. The results showed opportunities rather than constraints of organic farming in Rajshahi division, Bangladesh. The awareness percentage among the people regarding organic farming is 70% which is high. A constructive action plan is suggested as a result of this work that would help to solve the problems of organic farming in the target territory.

Findings of this research showed that organic farming has been a profitable enterprise in the area. However, to ensure long-term of organic farming possibility and to increase the number of organic farms, several actions need to be considered. Firstly, vermicomposting or poultry manure need to be used to maintain the fertility of soil. Secondly, strict policy and action need to be implemented on national level to promote organic farming. Thirdly, strong collaboration of the farmers with the organic seed suppliers should be made. Fourthly, farmers should be inspired with successful stories about organic farming.

Key words: Organic Farming, Vermicomposting, Territory, Action Plan, Components

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ABBREVIATIONS AND TERMS

OECD: Organization for Economic Cooperation and Development

NGO: Non-Government Organization

WASPA: Wastewater agriculture and sanitation for poverty alleviation

STW: Shallow tube wells

SRDI: Soil Resource Development Institute (Bangladesh)

IFOAM: International Federation of Organic Agriculture Movements

BARI: Bangladesh Agriculture Research Institute

PROSHIKA: Proshikkhan Sikkha Karmo (Training, Education, Action, Bangladesh)

BRDB: Bangladesh Rural Development Board

SWOT: Strength, Weakness, Opportunity, Threat

Novo Krishi Andalan: New Agriculture revolution

FAO: Food and Agriculture Organization

DAE: Department of Agriculture Extension

1 INTRODUCTION

During the last few decades, organic farming has been popular around the world. It has been dramatically establishing its prior significance in the modern society. In addition to this, its influence and importance is growing in the livelihoods of human and nature. The concept of organic agriculture began in the early part of 20th century. Growth of organic farming has largely been led by the increasing demand from consumers of mostly developed countries throughout the world (Sac, 2015).

In many countries, organic agriculture is placing its movement in the “mature phase” of development, integrated as one of the path of agriculture. According to the researchers, field experiment organic agriculture practices are broadly more environmentally friendly than conventional agriculture. Eventually it has become preferable in agriculture sector and widely acceptable agricultural practices. It is obvious to say that, there is no better alternative of organic products in the present perspective of health-conscious society till date (Stephen et al. 2003).

Bangladesh is densely populated country with more than 160 million people and there is huge demand of convenient goods. Due to the huge demand of agricultural products, the farmers started practicing chemical fertilization to meet the domestic demand after the Second World War. Due to the fact, people are experiencing so much health problems which is now a big national concern and because of that organic products are desired. There are several organizations along with NGOs are being involved in making awareness regarding organic practices and motivating the potential farmers in Bangladesh. (Sac, 2015.)

1.1 Background information of the study

1.2 Target territory at a glance

Rajshahi is one of the major commercial territory of Bangladesh located on the mid-western corner of the country. Rajshahi division is one of the six administrative divisions of Bangladesh and it is divided into 8 districts, whereas mostly targeted districts are Rajshahi, Nawabganj and Naogaon. The area with around 18million population which covers 24% of entire population of the country referred to (table 1). (WASPA, 2006). And it is characterized by cheap labor force as well (Banglapedia, 2015).

Table 1. Rajshahi division characteristics are presented (Banglapedia, 2015)

Divisions								
Area (Sq km)	City corporation	Dis-tricts	Sub-Dis-tricts	Munici-pality	Population		Densit y (Sq km)	Literac y (Rate %)
					Urba n	Rur al		
18174,4	1	8	70	35	2,8 m	13,6 m	1050	68
Districts								
Names	Area (Sq km)	Sub-districts	Municipali ty	Populati on (Million)	Density (Sq km)	Literac y (Rate %)		
Joypurha t	965,44	5	3	0,90	877	54		
Naogaon	2435,67	11	2	2,4	696	63		
Nawabga nj	1702,56	5	3	1,5	838	75		
Natore	1896,05	6	4	1,6	803	70		
Pabna	2371,50	9	8	2,2	917	60		
Bogra	2898,25	12	5	3,1	1042	58		
Rajshahi	2407,01	13	6	2,3	950	79		
Sirajgonj	2497,92	9	4	2,7	1845	56		

The agricultural land of Rajshahi division is 1,276,861 hectares which has been referred from (Table 2). Medium and large sized holdings area are under the Naogan and Nawabganj territory mentioned as the number 8 at (Table 2). Rajshahi districts area is represented by Medium sized farm holding area mentioned at the following (Table 2) as number 7. The main sources of income is agriculture which is 60.36 % (Banglapedia, 2015). The division is well known for its agricultural contribution such as fruits, fisheries, vegetables and rice (SRDI, 2013).

Table 2.Characteristic of holdings classified by Area size for Rajshahi division (Census of Agriculture, 2008)

Items	Non-farm Holdings				Farm holdings by areas and size			
	All holdings	With no operated area	With no cultivated area	With 0.01-0.04 acre Cultivated area	Small	Medium	Large	Total farm holdings
					0.05-0.49 Acre	2.5-7.49	7.5 + acre	
1	2	3	4	5	6	7	8	9

The use of shallow tube wells (STW) was found in Rajshahi division which is used for irrigation purposes and has intensified in agriculture. (Hossain., 2015). The target territory is geographically located in a most lucrative commercial place with availability of all the possible resources needed for establishing an organic farm. The area is mostly convenient for the transportation and easily connected with other major cities including Dhaka which is capital city of Bangladesh.

1.3 Components of organic farming

After the introduction of chemical fertilizers in the later parts of the 1800s in Europe and the USA, the organic farming movement arose over the concern of degrading quality in crops with an increase in diseases and pest attacks yields. Based on the published research of chemicals fertilizers of Sir Humphrey Davy and Justus von Liebig were the key founders of this theory and published their ideas in Elements of Agricultural chemistry and organic chemistry as well as its implementation to agriculture. The first modern chemist Baron Justus Von Liebig was taking a look in the growth of plant in his laboratory and

decided that plants needed minerals from the soil and carbon dioxide from the air .He displayed that whereas plants are also encompassed by the nitrogen in the air, actually they needed nitrogen in the form of ammonia in which roots absorbs and took up to other parts of plants. According to Liebig findings it showed that nitrogen was the most essential mineral and demonstrate that the synthetic chemical fertilizers could replace natural ones such as animal manures as the source of nitrogen. Liebig’s research radically changed the path of agriculture and became the basis of conventional agriculture that is practiced around the world. (Sac 2015, 24-27.)

To rise and develop the roots of Organic agriculture one must follow the principles of Organic agriculture which is presented at following (Table 3). These principles convey the input that organic farming can make to the world, and a vision to enhance the organic farming in the global context for the well-being of nature and human beings. According to IFOAM, these principles apply to organic farming in broad sense compiling on how people looks soils, water plants and animals to produce, prepare and distribute foods and other goods. (IFOAM, 2018).

Table 3. Principles of Organic farming (Sac, 2015)

Principles of Organic Agriculture	Description
Principle of Health	Organic agriculture should sustain and enhance the health of soil, animals, plants, humans and planets as one an indivisible
Principle of Ecology	Organic agriculture is based on the living ecological systems and cycles, work with them emulate them and help sustain them
Principle of Fairness	Organic agriculture should build on the relationships that ensure the fairness to common environment and life opportunities
Principle of Care	Organic agriculture should be guided in a responsible manner and being careful to protect the health and well-being of current and future generation and the environment

Farming is a part of our life from which we satisfy our hunger on the daily basis. No matter how man made so much of development in the entire world farming is the must activity to feed whole world with their desirable goods. Different methods of farming have been introduced throughout the world with several techniques.

Organic farming follows different systems that are more valuable for the nature conservation and human kindness. The various component of organic farming are presented below:

1.3.1 Crop Rotation

It follows the systematic management of different crops regular in sequence of period of two years or more than that. It is effective and play a vital role in maintaining the fertility of soil and as well as for the productions of successful harvestmen. Moreover, it helps to manage the weed, insects and reduce the diseases in crops. Organic farming desires the mixed cropping and livestock system for sustainable farming. (Sac, 2015).

1.3.2 Crop residue

Organic farming demands the crop residues/straws from the some of the major crops or vegetables like: Cabbage (leaves), Pulses (lentils, beans, Mung, Peas), rice, wheat etc. for the utilization in maintaining the nutrient balance in the soils. About 50% of the crops residues are utilized as fodder or food for animals. Proper care is needed to use the left-over residues after composting with efficient microbial inoculants. Different species like fungus (*Trichoderma*, *Azotobacter* etc.) have advantageous in physio-chemical properties of soil which helps in high crops yields. (Sac, 2015).

1.3.3 Organic manure

It complies with bulky organic manure and concentrated organic manure. Organic manure acts as the supplement for the growth of the crops and soil productivity. The direct effect of organic manure in the humid substances and decomposition of the matter and favorable for the growth of crops. Bulky organic manure consists of fewer amount of plants nutrient comparing to concentrated organic manure. Bulky organic manure includes farm yard manure, compost and green manuring. Concentrated organic manure are combined with

those materials that are rich in higher percentage of important plant nutrients such as nitrogen, phosphorous and potash, as compared to bulky organic manures. This organic manure concentrates on fishmeal, leftovers of meal, hoof meal and so on. Mainly this are made of raw materials of plants and animals. (Sac, 2015).

1.3.4 Absence of artificial chemicals

Organic farming avoids the artificial chemical fertilizers, pesticides, hormones feed additives and so on but it relies on crop rotations, crop residues, animal manures, off farm organic waste, biological diversity and encouraging biological systems increasing the nutrient mobilization. Besides this organic farming is the assurance allotted on farm-internal nutrient supply. This provides the positive impacts on the natural resource. Researchers with the evidences has suggested that organic farming tends to conserve the fertility of the soil. (OECD, 2003).

Organic farming is a method of production of crops and livestock that involves much more than choosing not to use chemicals, pesticides, fertilizers, genetically modified organisms, antibiotics and growth hormones. (Omafra, 2016).

Organic production is based on healthful production management systems to increase the productivity and fitness of diverse communities with the agro-ecosystem, including soil organisms, plants, livestock and the health of the people. The main principal of organic production is to establish enterprises that are sustainable and harmonious with the environment. (Omafra, 2016).

1.4 Differences between organic farming and conventional farming

The world has been depending on the land and other natural resources which is unlimited to meet the growing demands of human and to sustain the life for long-term. Different farming systems has developed during the civilization. Conventional farming is the one which was most popular in the green revolution to meet the growing demands. During the revolution, synthetic fertilizers, pesticides, herbicides were used to meet the growing demand in each house along in the industrial market area. (Akinyemi, 2007).

After few decades these showed up with several human diseases and as well as crop diseases which lead the new path for the organic farming concerning the human health and ecological damage of the nature. (Jennifer, 2008).

There are lots of differences between the organic and conventional farming from the production to the consumer. There are several characteristics or the features which can be compared. Organic farming supports the well-being of the nature as well as human-beings for the long-terms, but the conventional farming concentrates on just high yielding and doesn't provide the harmony to the nature. Different aspects of the environmental can be preserved and improved with the practices of organic farming comparing to conventional farming. For instance. The quality of the soil, nutritional value, pesticides cost, energy consumption cost etc. could be minimized which is today's most popular headlines of the 21century. (Jennifer, 2008).

Organic farming supports the soil quality with reduction of soil erosion and contamination of ground water which is mentioned in (Table 4). Similarly it cares for the health of the human by giving all the nutrition and fibres which is must in 21century whereas people nowadays are more health conscious and willing to pay more in the market. (Jennifer, 2008).

Although the production of the organic farming is lower as comparing to the conventional farming but the profitability is more by (22-35%) for the farmers that is briefly highlighted in (Table 4) below. These higher prices plays a vital role while compensating farmers for preserving g the quality of the land with due respect of future generation. (The guardian, 2018).

Table 4. Conventional Vs Organic farming (Agritech, 2018)

Conventional Farming	Organic farming
Centralization	Decentralization
Domination of the nature	Harmony of the nature
Dependent on chemical fertilizer	Independently grown up
Competition for fulfilling Market demands	Welfare of the community
Specialization	Diversity
Exploitation	Restraint

Organic farming is more likely to be the best farming practice. Though it is still in an experimental period of developing its productivity to meet the massive demand of huge population around the world, In addition with this, more efforts needed to increase the productivity from organic farming and defeat the conventional farming to save the future.

1.5 Present situation of organic farming in the target territory

Organic farming is currently holding a huge demand nationally. The potential market of organic products is triggering its necessity to the consumers. Therefore, consumers are willing to pay more to buy the products according to the market analysis by BARI (Bangladesh agricultural research institute). Rajshahi division is the second largest populated area with residents of higher earners and the consumers are found health conscious. (Interview, 2018).

There are some local farmers who are currently practicing fertilization without using any chemical pesticides. There are some private sectors that have launched vermicomposting (Bio-fertilizer) for the cultivation. Vermicomposting is one kind of organic fertilizer and a combination or manure that is used to regain the quality of the land and make it reliable for the future cultivation. This kind of fertilizer enhances the crop production. This kind of fertilizer also very nutritious for crops. It contains cocoon that helps to grow more earthworm in the land to make the soil alive. Local farmers are responding this fertilizer very well. (Daily sun, 2018).

Organic farming practices are spreading around the territory and some of the NGOs such as PROSHIKA are arranging training for operating a farm efficiently. PROSHIKAs Ecological agricultural program is serving the farmers across the country to convince the farmers to practice ecological agricultural system which is said to be an organic way of farming. (Greenwatchbd, 2018).

Due to the lack of structured policy for farming from the Government and for having an obstacle for the certificate from the food authority of Bangladesh, it is still remaining under recognition despite of having popularity in the territory. The potential farmers are advised to be following a general organic standard by IFOAM (Organic internationals). IFOAM sets some basic requirements for farming which is quite alike to the practices done by the local farmers and some private organizations that claim to be perfect practitioner of organic farming and now seeking for the recognized certification. (Interview, 2018)

There is a project called ``A house is a farm`` which is approved by Bangladesh Agricultural research institute (BARI) to gain attention of the common people to practice non-chemical cultivation at home such as on the roof, Balcony or at allocated area. The purpose of this project is to do a small marketing of the products and use them for home cooking as well. The project concentrates on Fruits, green vegetables like spinach, Bananas. The project is also motivating many entrepreneurs to be solvent by practicing farming anywhere possible around the living area or by leasing a specific land. (Bangladesh Agricultural Research Institute, Bangladesh 2018).

2 AIMS OF THIS WORK

This thesis is mainly concentrating on finding prospects and challenges of organic farming in a specific territory. This research focuses on finding the structured and formulated practices of organic farming in Rajshahi division, Bangladesh. To analyze the depth of the constraints of organic farming, the author is going to use the qualitative research. The study will be carried out focusing the specific territory by interviewing, observing and analyzing the present situation of organic farming. The purpose of writing this thesis is to accumulate a constructive solution to the problems related to the prospects and challenges of organic farming in the proposed area. This thesis work helps the assigner of this thesis topic to establish the organic farm in Rajshahi division, Bangladesh

3 MATERIALS AND METHODS

This research is made of qualitative data from the various sources. Reliable sources and the materials used in this writing are the main bank of information. The analysis of prospects and challenges demand authentic materials as some sources as the genuine research and an acceptable result from the research. Interview method was found most convenient and suitable method for the data collection. To get the proper support in the writing, the information retrieved from the various reliable sources such as online materials, books (SAARC agriculture centre and Books such as Organic farming policies and prospects. There are some case studies available with adequate information, in which practical experiences from involved people and organizations played very important role to get the writing nicely decorated.

3.1 Location of study area

The study area was carried out in Rajshahi division of Bangladesh. Study area has been observed properly to get sufficient knowledge about the target territory. The main location was narrow down for the better and more concentrative result from the observation. The division is divided into eight districts where as Nawabganj, Rajshahi and Naogaon considered to be the main targeted area for the farming. (Picture 1) illustrates the highlighted area in Rajshahi Division. These areas are equipped with all the required resources. In this case, Bangladesh agriculture research institute (BARI) will be one of the main supportive organization whereas PROSHIKA plays another important role for the farming.



PICTURE 1. Location of the study area and target territory

Rajshahi is a metropolitan city which is decentralized with most of the government and non-government organization. This was an opportunity for the author to study the area remotely from the research and report on organic farming earlier conducted by those organizations.

3.2 Research questions

Research question is the fundamental of solving a research problem. The more accurate and specific question keeps the research or any kind of study in track which is badly required to find constructive solution to the problem. In this thesis, there is a prime question raised to find the solution. The entire thesis runs after the following questions to be delivered with some findings.

The main Research question:

- **What are the prospects and challenges of organic farming in Rajshahi Division, Bangladesh?**

The necessity of the writing is to be working on analyzing the prospects and major challenges for establishing an organic farm in Rajshahi, Division, Bangladesh. The data from various sources and two interviews are analyzed deeply to enlist the problems and solve them.

The following sub questions are paid more effort to support the entire writing. They help the writer to work on specific problems to narrow down the thesis. Sub questions play important role to provide proper information about what actually needed for garnishing the body part of the thesis. The findings from the research questions including the main one are used as the ornaments of writing result and discussion part of this thesis.

Sub questions:

- What could be the market trends of organic products in Bangladesh?
- What are the resources needed to establish organic farming?
- What criteria could be followed to establish an ecological organic farming?
- What are the current local practices of organic farming in the target territory?

3.3 Data collection

This research was made by collecting on primary and secondary data. The primary data comprises of interviews, observations, or through direct communication (Kothari, 2004). In this thesis the secondary data supports the conceptual ideas, theories and facts of proposed topic. The secondary data was collected from various online (Sac, 2015), government publications (Bangladesh Agricultural Research Institute, Bangladesh 2018., Soil Resources Development Institute, Bangladesh 2013, & Bangladesh Rural development Board, Bangladesh 2018). are the most effective ingredients brought down to the theoretical part of the thesis. The main idea is to explore the key information in an effective way which is widely acceptable if the data is collected from genuine secondary sources (Kothari, 2004).

In this case, as there was no physical attendance at the territory to observe the situation the reports of SAARC agriculture center and conducted interview results from the Entrepreneur and PROSHIKA area manager were precisely defined in this thesis.

3.4 Interview

Interview questionnaire to the Entrepreneur:

- Could you please introduce yourself?

- How did you come up with an idea of establishing organic farm?
- Could you please describe your project in short?
- What do you mean by organic farming in your point of view?
- What is the present situation of organic farming in Bangladesh?
- What are the market trends of organic products in Bangladesh?
- What are the main cultivating items and livestock in the farm?
- What are the basic requirements for establishing an organic farm?
- What are the resources going to be used?
- What kind of training needed to the involved workforces?
- Is there any legal agreement required to establish farm?
- What is the employment trends in Rajshahi, Bangladesh?
- In which level of awareness about organic farming is known to the residents of target territory?
- How do you gain the recognized certification to market your products?
- How do you think to gain government or NGO's attention for your project?
- How do you manage organic manure for the cultivation?
- How do you finance your project?
- How do you measure the land quality of the target territory whether suitable for farming or not?
- How do you get supplied water for your farming?
- How big the area should be or already proposed?
- How do you get supplied seeds and livestock materials for the farm?
- Do you need to have any specific training for farming?

There is another interview conducted with an Area manager of PROSHIKA who provided sufficient information about the query. The interview was taken place over phone which has been arranged by the Assigner of the thesis. This research has got some valuable information regarding the current facts of organic farm in the territory. The following questions were designed to conduct the interview.

- How does PROSHIKA support farmers who are willing to establish organic farming?
- Do you have any connection with government or local government bodies to get involved in farming?

- How do you help farmers to obtain reliable certification for organic products?
- How do you encourage farmers and help them learning about organic farming?
- How do you supply seeds and livestock materials to the farmers?

3.5 Data Analysis

In this research data about the target territory were analysed from the geographical location and other information of Rajshahi Division referred from the Picture 1, Table 1 and Table 2. Prospects and challenges were figured out from SWOT analysis which is referred to Table 5 and Figure 3. Action plan was made based on the interview results and analysed major challenges referred to the Table 4.

4 RESULTS AND DISCUSSION

4.1 Organic farming awareness and market trends

Our research showed that, the farmers and consumers in the target territory is a practice of farming where natural resources are used to farm by avoiding synthetic chemical compounds. To supply the essential nutrients to the plants farmers uses usually cow dung, compost from their own household bio-waste, green manure using their own garden waste for example leaves and straw. The farmers uses different techniques which are subjected to non-chemical measures for example hand net, light trap etc. and controlling biological practices for e.g. rearing of beneficial insects and pathogens. Due to health diseases and loss of fertility of soil people in Rajshahi division are more conscious to find the solution of its practicing the sustainable way of farming which is organic farming has become the best alternative and eye-catching topic. Eventually the level of organic farming awareness is at high peak with the concern of health and environmental issues in the target territory which is illustrated in (Figure 1). The target territory is fully commercialized and the people residing in the target territory are literate and in touch with social and other media. By observations, interviews and analysis from the secondary sources it can be assumed as majority of people of the target territory are aware of harmful effects of pesticides or fertilizers on human body and environment. People in the target territory just practices the organic farming only for their own house yards in a very small scale.

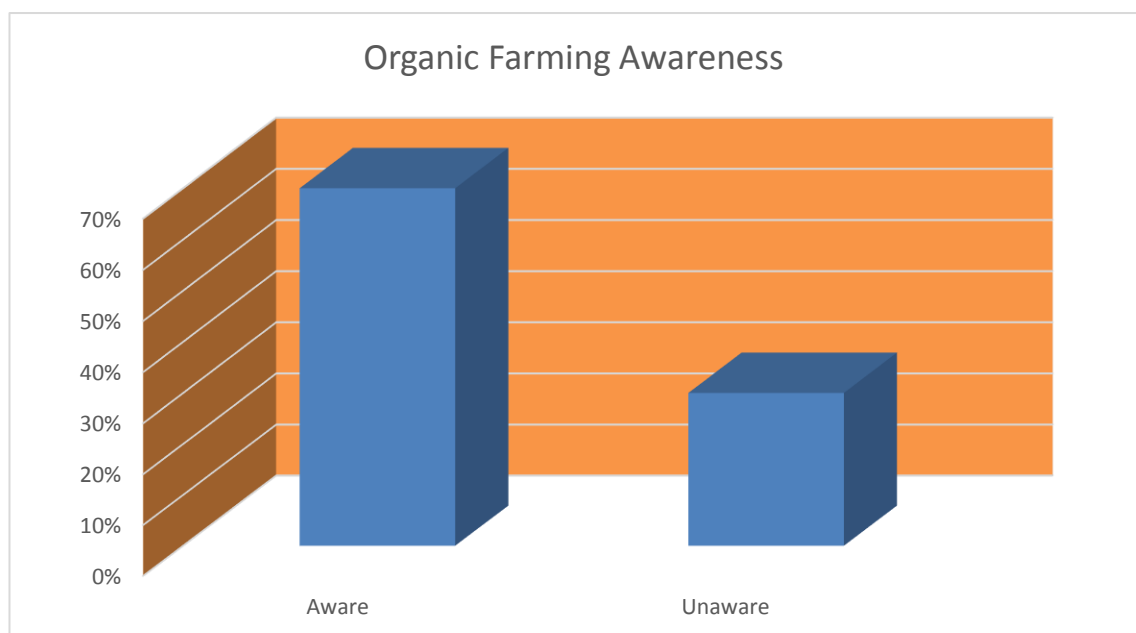


Figure 1. Organic farming awareness

Above figure state that majority percentage of population of target area is aware of organic farming. Though they are not very much familiar with the organic terms, rather they call it natural farming in the target territory. (Interview 2018)

Market trends: The result of our data analysis shows that, there is a huge market prospects of safe food in the target territory and the awareness of organic products referred from the figure 3. In our findings shows that increasing awareness regarding health and environment issues has been forcing the sales of organic foods dramatically over 22% annually (Organic systems.org, 2018).

For non-commercial purpose, there are so many small farms on the yard of private house owners. Due to urbanization, residents of city areas are completely dependent on the local markets whereas they are seeking for safe food all the time, in case found organic products in the market are sold in higher prices most of the time. Therefore, market for these products are increasing significantly in the target territory. As there is no particular way to identify the products whether they are organic or not, they buyers are depending on the word of mouth from the seller. In this case, there is huge potentiality of organic certified products, such as certified by IFOAM. Mainly marketing of organic products done by contract farming. To develop market trends by root there was an initiative called naya-krisi Andolon(New Agriculture movement) which began in 1988 with the involvement some of the NGOs such as PROSHIKA. PROSHIKA has been working for commercializing the organic agricultural practices.

4.2 SWOT analysis of target territory

SWOT analysis is the most suitable to analysis tool to evaluate the target territory. According to the SWOT analysis, there was lots strengths and opportunities which supports Organic farming. At the same time there were few weaknesses and threats. With the help of SWOT analysis both internal (Strengths and weaknesses) and external (opportunities and threats) factors of organic farming were examined to achieve the goals of project which is presented below at (Table 5). This analysis may help the potential farmers or entrepreneurs to get a clear picture about the organic farming and its establishment in the Rajshahi division.

Table 5 SWOT Analysis of target territory

<p>Strengths</p> <ul style="list-style-type: none"> • Available of fertile land • Transportation facility to export the products • Easy water Supply • Availability of training and technologies for organic production • Motivated and committed organic sector • Available of cheap work forces 	<p>Weaknesses</p> <ul style="list-style-type: none"> • Scarcity of leasing land • Lack of added value • Trust gap between suppliers • Lack of fully organic seeds • Difficult entry in local market
<p>Opportunities</p> <ul style="list-style-type: none"> • Increasing awareness regarding benefits of organic farming • Increasing awareness in local markets of certified organic products. • Increasing overseas supply opportunity • Involvement of government, private organization and non-governmental organization. • Supporting the welfare of nature, quality of soil, and human-life in a long-term. • Increasing investment support from NGOS and other communities. • Increasing support of raw materials techniques of organic farming from NGOs 	<p>Threats</p> <ul style="list-style-type: none"> • Competitions • Climate change • Contaminated underground water supply for irrigation (for e.g. arsenic) • Impact of loss of organic matter in soil

4.3 Prospects of organic farming in the territory

Our survey showed that, Bangladesh is a developing country where people are becoming more health conscious and concerned about the nutritional fact with high quality organic products. Bangladesh is one of the top 10 food grain producing countries in the world according to the news published in the Economist. According to the food and Agricultural

organization (FAO), Bangladesh is placed in the third position for the vegetable production. The country has some of the most fertile agricultural land in the world. Awareness among the local people seems to be very high as Bangladesh hold the one and only Agricultural University in Asia. Eventually young people are also aware of the benefits and advantages of organic farming in Rajshahi division. As a result, according to the interview young persons are the entrepreneurs or volunteers of Organic Farm. There has been conducted sever campaigns, events and seminars to promote the chemical free products called organic to sustain your life healthier and happier.

After analysing the external (opportunities, threat) and internal (Strengths, weaknesses) factor of the target territory that affected the organic farming are presented in the table referred to (Table 5).

The rural Bangladesh offers much remuneration that would make organic cultivation (Fruits, vegetables, rice, livestock etc.) methods relatively easy to implement. The target territory for the farm is mostly equipped with everything needed for the farm. During this research, significant number of prospects found to support the farm activities. All the prospects carry out all the necessary features and can be considered for establishing an organic farm with lots of potentiality. The prospects are presented below.

4.3.1 Organic products or foods Awareness

Current generation is completely aware of the benefits of organic products on the other hand the rest of the population are understanding the importance of safe food for their future generation. From the prior research, it was a delightful that there is a good ratio of awareness about the organic foods and products. Awareness is considered to be one of the crucial aspects to identify the prospects of the farming in the territory. The growing demand and growing awareness of benefit of organic farming which promote the overseas export opportunity. Due to the favorable climate for the indigenous plants and livestock there is huge chance to produce the organic products. (Sac, 2015).

4.3.2 Cheap labor market

Workforce is the main resource for the farming as long as the farming concern about the natural way of practice farming which is possible with the involvement of the local farmers. Interestingly, the target territory is well supplied of workforces from the surrounding with very cheap wages. This is the key prospect for farming till date and relatively cheap labor fit to produce the organic products in easy way. The target territory offers more considerations that would make organic cultivation (Fruits, vegetables, rice, livestock etc.) methods relatively easy to implement with the help of local labor. (Interview, 2018). Cheap labor is one of the main influential factor which support the opportunity to enter the overseas opportunity market as well. Due to the availability of cheap labor it's very easy to implement or establish the farm.

4.3.3 Availability of water supply

Water supply is the main resource for the farming which is available and easy to get supplied. Deep tube wells or local canal pipe from the river are the sources for the irrigation of farming. Rain water is also saved in the different ponds to use water later is practicing. The target territory is under the supervision of Bangladesh rural development board (BRDB) which is on the department of Bangladesh government to ensure the water and other related resources supply to the farmers. The board commits adequacy of water supply with the water supply plant called ``deep wells`` with a very affordable cost which is demonstrated in the following pictures (Picture 2 and 3). There are some private enterprises also across the territory who provide water to the field from their own water plant. On the other rain water is considered to be the best and free sources that is generally stored traditionally though there are affordable equipment found the territory for storing water for farming. Solar-pump turns boon to the Rajshahi farmers, this is the newly commissioned solar energy based irrigation which is used in the Rajshahi division with a high demand. (Observerbd, 2018).



PICTURE 2.Solar-pump for water supply (Observerbd, 2018)

The following picture shows how water supply plant is placed in the agricultural field (Picture 3).



PICTURE 3. Tube wells in Rajshahi, Barind territory (Thedailynewnation, 2018)

4.3.4 Logistics support

The target territory is commercialized place where there is sufficient logistic which supports like; doctors, hospitals, modern diagnosis systems, developed communication with active media and so on. There has been so much of health issues due to excessive chemicals in the farming so the people demands for the fresh, healthy and chemical free agricultural products. (The independent, 2018).

4.3.5 Good Transport facilities

Transportation is very precious facility for fulfilling the demand of present era. Transport facilities plays a great role in the production to consumer hands. There is high availability of transportation facility for the organic products in the Rajshahi division within the producers and to the supermarkets, retailers etc. There is a mutual trust with good communication while transporting the productions to suppliers. In this research this facility is considered to be one of the best convenient advantage for the farming as the organic foods and products are strictly recommended to use within short time.

4.3.6 Expanding local markets due to urbanization

Bangladesh is listed as most populated country in the world with urbanization. With the vast growing urbanization, the local market are also expanding to sell the organic products with local certification which are supported by NGOs and Local government like: Proshika, BARI and many more. Safe food market is now a biggest challenge in Bangladesh whereas Rajshahi is one of the healthiest city in Bangladesh. Organic foods and the products market is able to spread its importance across the city and local markets. Expanding market is giving much inspiration to the farmers to be practicing healthy Agriculture. (Sac, 2015).

4.3.7 Agro-based industry

Bangladesh is an agro-based industrial country with suitable environment for the agriculture. Agriculture is one of the main driver for increment of the economy of the country. After the SWOT analysis of the target territory the author found some factors which supports the possibilities of organic farming in the target territory, Rajshahi division. The local market and its expansion is necessary, on the other hand if the whole country industry is agro based then there is huge potentiality of farming. (The independent, 2018).

4.3.8 Overseas export opportunities

Export is the best platform for contributing in the national GDP. As the organic products are sold in higher price, there is a potentiality for farming in the territory as the cheap labor and other resources are available. In the near future, the target territory can be the

best place for organic farming and the farmers will be able to export overseas after meeting the local and domestic demand. In addition with this, western world is equipped with technologies but having scarcity of vegetables, fruits and other livestock production. The western and developed countries are mostly dependent on import of food items from outside, whereas there is a chance for exporting products to the developed countries from the target territory.

Free safe or Organic Food Campaign conducted by educational and various institute: To raise the awareness of safe food there are various campaign held across Bangladesh and eventually in the Target territory. Those kind of campaign helps the motivated farmers to have a free marketing scheme out of it. The campaign are mainly conducted by different kind of NGOs and educational institution that have good impact on the society. The campaign conveys the message about the necessity of safe food for the people and the side effects of the conventionally grown up products. This is one of the great opportunities for the potential farmers to be involved in the organic farming.

4.3.9 Supportive involvement of local governments and NGOS

Although there is no strict policy or standards of organic farming in National Level. But some non-governmental organizations are very active in supporting the organic farming. For example: recently BARI has introduced a standards and PGS system. There are 68660 hectares of land under certified organic. Still there are many farms and production which are organic but due to lack certification products are forced to combine as the products of conventional farming. NGOs and some private organization are the main initiators to take the steps to encourage people by giving trainings of organic farming. Later on government, especially BARI is active in supporting the farming with research, techniques and development. (Sac, 2015). Nayakrishi Andolan (New agriculture revolution) whereas in Bangla Krishi means cultivation which refers to cultivating with the benefit of soil, nature and human-life and Andolan refers as a movement. Nayakrishi has spread out to 200 in various regions in Bangladesh including the Rajshahi division. They don't use the chemical and pesticides instead of it they use natural techniques such as crop rotation, diversity species and mixed cropping to avoid the weed problems and to maintain the quality of soil. Nayakrishi andolan follows 10 principle which are based on experienced and agreed farmers. In addition with this, they are supporting from training to supply of organic raw materials, finance and marketing. (Bangladesh.com, 2018).

4.4 Major challenges of organic farming in Rajshahi Division

In spite of having handsome number of prospects for farming in the target territory, it is advisable to take into serious consideration of major challenges might be faced that is presented below in the (Table 6). There should be a precaution ready before hand for any kind of uncertainty. The challenges can be overcome if they are identified properly in time. There can be so many obstacles that should be prevented after a smart observation of the challenges.

Table 6. Major challenges and solutions

Major Challenges	Proposed solution
Declining fertility of the soil	This can be solved by adopting vermicomposting. These composting are rich in high macro and micro nutrients, vitamins, growth hormones and immobilized microflora. The average nutrient content of vermicomposting is much higher than that other thing Application of vermicomposting facilitates easy availability of essential plant nutrients to crops as well as soil. In addition to this, these helps to maintain the fertility of the soil. The second alternative would be the poultry manure can be also used to boost the fertility of the soil (Sac, 2015).
Higher Prices of Organic products	Due to the lack of productivity of organic production the prices of products are higher but this issue can be solved with the motivating the organic sectors and farmers to adopt the organic farming with the availability of organic resources and training.
Lack of availability of fully organic seeds.	Strict action or policy should be made by government of Bangladesh in national level. Collaboration with the organic seeds supply organizations.
Lack of trust between producers and suppliers.	Training, sharing the information about the organic farming

4.5 Action plan

Action plan is the key task for the potential farmers for establishing organic farming in Rajshahi Division. There is a constructive action plan made on the basis of the research. Action plan is the proposed solution with some key techniques for execution. This might help the potential farmers to make a rough decision whether to go for the farming in the target territory. The action plan is referred to the (table 7) below:

Table 7. Action Plan

Themes	Goals	Action
Understanding Organic farming	To increase the experiences through the research and findings or experimental basis organic farming	Information gathering from reliable sources such as; Internet, Books, Journals, Research, Videos, Gaining the experiences through motivational story of organic farmers.
Find the suitable location	Suitable Environment without any contamination	Farm size, Crop distribution, types of crops and animals
Planning of Resources	Availability of all the resources	Confirming finance, facilitating logistics, analysing labour market and Acquiring organic products market, to familiarize with latest technologies used for organic farming.
Soil Analysis	Sustaining Quality soil	To evaluate the characteristics and status of the soil such as; Soil structure, organic matter content, nutrients level of soil, measurement of erosion level at what extent, Ph level
Water management	Well supply of water	To reserve sufficient water from rain in the pond and in a well-equipped tank. To ensure uninterrupted water supply from other sources.
Organic Policies and Standards	Gaining sustainability	IFOAM Organic standards National policy regarding Organic farming
Current market trends and demands	Expansion of Organic market	Networking or expanding collaboration with organic markets and local and international markets
Organic resources	Reliable supplier	Selection of seeds, vermicomposting, Crop rotation, weeds management

Certifications	Customers trust	Transparency to the consumers about the products certified
Management	Smooth operation	To do proper planning, organizing, staffing and controlling the entire farm
Expertise supervision	To be in track	Having a collaboration with NGOS like Proshika,BARI, and to be in touch with expertise services from organic experts
Risk assessment	Security	To be aware of Slow reaction of compost, Nutrient management, Climatic changes and to ensure back up plan.

5 CONCLUSION

This study showed that organic farming has been a profitable enterprise in Rajshahi division target area. The above findings and results supports organic farming with all developing infrastructure in the target area in Bangladesh. The three targeted districts and their holdings for the farming meet the expectation for the farming. After observing and using SWOT analysis tool along with the interviews it was found that farmers in the Rajshahi division have started to grow the vegetables using very popular compost called vermicomposting. Along with vegetables the farmers are also practicing the livestock productivity, aquaculture and fruits too.

It was also found out in this study that, from the research that, Rajshahi division is well equipped with sufficient water supply which is the most required resource. There were some major challenges spotted as well, that can be solved with some proposed solutions. These major challenges are: declining fertility of soil, higher prices of organic products, lack of availability of fully organic seeds and lack of trust between the producers and suppliers. Similarly, these challenges can be solved by adopting vermicomposting or poultry manure which helps to maintain the fertility of soil, motivating the organic sectors and farmers to adopt organic farming with available trainings and organic resources, strict actions and policy should be implemented in a national level and adequate level of trainings with inspiring stories should be shared. One important thing noted during the research is that sometimes the farmers have no trust in the real organic origin of supplied seeds or in the proper labelling of the organic products by the distributors. Therefore trustworthy relationships need to be built up for a successful organic farming.

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APPENDICES

Appendix 1. Interview 1: Entrepreneur of organic farm in Rajshahi, Division, Md. Aatur Rahman

1. Could you please introduce yourself?

I am Md. Aatur Rahman 33 years old originally from Bangladesh and currently working as an Entrepreneur respectively in Finland and Bangladesh.

2. How did you come up with an idea of establishing organic farm in this particular territory?

I belong to a family involved in Business and Agriculture. I got inspiration from my family and intending to pay some efforts on doing some additional responsible job by establishing organic farming. Because, Bangladesh is a densely populated country and now days facing a big trouble of chemical fertilizing agricultural practices. I am trying to grab this opportunity to market organic products to the market after analysing its potentiality in Bangladesh. Rajshahi is the most convenient city for everything such as transportation, workforces, raw materials, training centre, and financial institutions.

3. Could you please describe your project in short?

The project is to establish a farm in a single area of land in lease. And the farming will be based on leafy vegetables, milk production, fisheries and seasonal fruits.

4. What do you mean by organic farming in your point of view?

An agricultural practice which is mainly avoiding all kind of chemical fertilizers and instead using manure, vermicomposting and let the lives grow naturally.

5. What is the present situation of organic farming in Bangladesh?

There are few farms in Bangladesh that are working with organic products but there is still huge demand of organic products in the country.

6. What are the market trends of organic products in Bangladesh?

People are ready to pay more for the organic products as the people are getting sick of chemically fertilized products. Now days, people are taking into account to pay more rather than paying for hospitalization due to chemical reaction in the body.

7. What are the main cultivating items and livestock in the farm?

Milk production, Leafy vegetables, seasonal fruits and fisheries.

8. What are the basic requirements for establishing an organic farm?

A land with a sufficient area and resources like water, Workforces, a short training, finance, supply of raw materials.

9. What are the resources going to be used?

Water, organic fertilizers, manure, demi composting, compost.

10. What kind of training needed to the involved workforces?

There are some basic theoretical and practical know how needed to get into the job which will be provided on the orientation of work.

11. Is there any legal agreement required to establish farm?

There is no legal agreement needed for the establishment except the allocation permits from the local authority.

12. What is the employment trends in Rajshahi, Bangladesh?

Workforces are easily found in the territory and they charge on daily basis. And 8 hours work is counted as a day work. There is no specific labour union for the agriculture sector but wages are based on the area of living.

13. In which level of awareness about organic farming is known to the residents of target territory?

People are getting to know about it from the different medias. Though there was 100% organic way of practicing agriculture 4 decades before but the people have not sensed it massively. Now days people are being aware of difference between organic and non-organic products.

14. How do you gain the recognized certification to market your products?

There is some certification which will be gained from Asia regional organic standard (AROS) and IFOAM international organic.

15. How do you think to gain government or NGO's attention for your project?

Government and the NGOs are already inspiring the farmers to practice agriculture in an organic way, Therefore, they have their eyes and attention on the new upcoming entrepreneurs.

16. How do you manage organic manure for the cultivation?

Its collected from the farm livestock. The idea is to maintain an ecosystem in the farm.

17. How do you finance your project?

Rajshahi Agriculture development bank (RADB) and some private banks will provide 90% support of total investments and rest will be contributed from own investments. Some NGOs such as PROSHIKA are also providing some schemes for the new entrepreneurs that might be considered as well.

18. How do you measure the land quality of the target territory whether suitable for farming or not?

The land which has been used less for cultivation by using chemical fertilizers and located little bit isolated area. The area must be adequately supplied of water.

19. How do you get supplied water for your farming?

In Rajshahi division, BRDB (Bangladesh rural development board) is responsible for collecting deep-water that will be considered as one of the sources. Rain water in rainy season is the best effective way of supply water that will be stored in artificial pond.

20. How big the area should be or already proposed?

The area is expected to be minimum of 10 acres or over 40K square meters.

21. How do you get supplied seeds and livestock materials for the farm?

There are stores across the country that either import from Japan, India and the remote areas farmers. We can easily get supplied from them.

22. Do you need to have any specific training for farming?

Yes, there are some short training program starting from a week to nine months in length by Department of Youth development, Bangladesh and plan is to grab one of the convenient length of training.

Appendix 2. Interview 2 with Area Manager of PROSHIKA Rajiul Islam a NGO, Rajshahi Branch

1. Could you please introduce yourself?

I am Rajiul Islam, working as an Area manager of proshika since 2013 for Rajshahi Zone.

2. How does PROSHIKA support farmers who are willing to establish organic farming?

PROSHIKA provide all kind of supports such as financing, training, supply of raw materials and development training program.

3. Do you have any connection with government or local government bodies to get involved in farming?

Yes, the government of Bangladesh permits NGOs to work for the wellness of the country.

4. How do you help farmers to obtain reliable certification for organic products?

PROSHIKA helps to link up with the international certification organizations.

5. How do you encourage farmers and help them learning about organic farming?

There is some occasional training program conducted on demand in PROSHKA to make awareness and motivate the interested entrepreneurs.

6. How do you supply seeds and livestock materials to the farmers?

PROSHIKA does not directly supply the materials but link up with the reliable suppliers and help the buyers to identify actual organic manure.