

Lesson from the Perspectives of Farmers about Problems of Agricultural Production: A Case of Rural Bangladesh

Abu Russel Md. Repon¹, S. M. Imtiaz², Md Shafikuzzaman Joarder³, Sumana Akter⁴

¹Professor, Department of Sociology, University of Rajshahi, Rajshahi-6205, Bangladesh

²Associate Professor, Department of Sociology, University of Rajshahi, Rajshahi-6205, Bangladesh

³Professor, Department of Sociology, University of Rajshahi, Rajshahi-6205, Bangladesh

⁴Former Faculty Member, Department of Sociology, Varendra University, Rajshahi, Bangladesh

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Abstract:

This paper investigates the problems of agricultural production in the rural areas of Bangladesh. Change is explicitly clear in the agricultural production system from selecting seeds to preserving crops by the respondents. Thus, so many problems of agricultural change played a role in the activities of the rural people. There is a noteworthy change in water, seeds, fertiliser and pesticides in the study area that boosts production more and improves the lifestyle of the rural people. Both qualitative and quantitative methods were employed. Data were collected using the tools and techniques of social survey, Focus Group Discussion (FGD), and Key Informant Interviews (KII). Respondents are well-known for the problems of agricultural production regarding cultivation methods, irrigation, seeds, fertiliser and pesticides. Agricultural production has also been changed in the study area.

Key Words: Agriculture, Crops Production, Agricultural Production

Introduction:

Agriculture means the cultivation of land, including horticulture, fruit growing, crop and seed growing, dairy farming and livestock breeding (Russell, 2006). In Bangladesh agricultural sector is divided into four sub-sectors-crop, livestock, poultry, and fishing. Besides these four, the forest sub-sector may also be mentioned (Rahman, 1992). Bangladesh is a land-scarce country where agriculture is the mainstay of the economy contributing over 22 percent to its GDP (Quasem, 2008). The economy of Bangladesh is predominantly agro-based, and more than 60 per cent of the total labour force is attached to and dependent on agriculture (Mia, 1993). This tendency has decreased over the years. Now, the

agriculture sector contributes about 17 per cent to the country's Gross Domestic Product (GDP) and employs more than 45 per cent of the total labour force (BBS, 2018). Although different varieties of crops are grown in Bangladesh, rice is still the overwhelmingly dominant crop in terms of acreage and importance as the staple food. Rice alone accounts for about 75 per cent of the cropping area in the country (Mainuddin *et al.*, 2011). Many observers have attributed Bangladesh's lack of food grain self-sufficiency to factors such as population growth, the failure to adopt appropriate modern agricultural technology, government interference with agricultural prices, inadequate financial institutions, or insufficient investment in irrigation facilities (Jannuzi and Peach, 1990).

The cropping pattern has changed over the years. The big farmers or business companies capture most of the agricultural land. The subsistent farming system has been changed into a specified cropping pattern. Many of the peasants are losing indigenous seeds due to the use of high-breed seeds and the use of chemical pesticides has affected human health (Sarwar, 2007). In rural Bangladesh, about 40 per cent of the cultivated land is now operated by the tenants, compared to 23 per cent in 1988 (Hossain and Bayes, 2010). Mondal (2010) maintains that crop production in agriculture in Bangladesh is constrained every year by challenges, such as loss of arable land, population growth, climate changes, inadequate management practices, unfair price of produce, and insufficient investment in research. He also holds that in Bangladesh, about 80,000 hectares of arable land is going out of production every year. Hossain (1988) confirms that irrigation harms the diversification of crops. Except for rice and oilseeds, all crops are grown less often on irrigated land than on unirrigated.

The farmers were deceived into buying low-nutrient single superphosphate (SSP) fertiliser because of its colour resemblance to triple superphosphate (TSP) and SSP (Akanda et al., 1999). Kashem et al. (2007) mention that increased cropping intensity and sustained productivity of the soil are important factors to achieve self-sufficiency in food. A sharp decline in soil fertility is a threat to sustainable crop production. Choudhury (2008) reveals that soil fertility is declining every year due to abuse and overuse of land for deficiency of organic matter, water logging and lack of nutrients. Marketing problems are significant barriers to upgrading diversified agriculture in rural Bangladesh (Alam, 2009) as the price of crops is important for the development of the rural people (Younus, 1993). On average, Bangladesh is losing good quality agricultural land by approximately 80,000 hectares annually due to urbanization, the construction of new infrastructure such as roads and the implementation of other development projects (Bodker et al., 2006). Agriculture sectors

in Bangladesh are also encountering several environmental problems some of which are recurrent, such as floods, droughts and cyclones while others are more long-term and incremental such as deforestation, decreasing water availability and increasing salinity (Huq et al. 1990). According to Rabbani et al. (2007), few constraints are the representatives of agricultural problems. Such problems include i) dependence of agriculture on the vagaries of nature involves risks such as natural disasters (ii) diminishing the availability of cultivable land, (iii) widespread poverty among the population engaged in agriculture, (iv) lack of required capital for agricultural activities, (v) inadequacy of appropriate technology considering farmers socio-economic conditions, (vi) uncertainty of fair price of agricultural commodities due to underdeveloped marketing system, (vii) rapid perishability of agricultural commodities and high post-harvest losses (viii) limited knowledge of common people about the nutritional value of agricultural commodities including vegetables and fruits. Moreover, agrochemicals use has become essential input for the cultivation of high-yielding varieties (HYV) of rice and other crops. Agricultural production worldwide depends largely on natural resources: land, features of soil, water, pasture, fish, forest, biodiversity, and the genetic resources of plants (Voegelé et al., 2008; Freeman, 2008). According to Yaseen et al. (2011), rice being the staple food occupies a central position in the agricultural farming system in Bangladesh. Traditionally single cropping was practised, but at present, multiple crops are being produced. In many cases, these have impacted the development of the rural people.

Research Methodology:

The study was conducted at Bilsha village of Gurdaspur upazila under the district of Natore, Bangladesh. According to the Bangladesh Bureau of Statistics (2001), the total area of Bilsha was 1891 acres, and the total number of households was 797. This study is both qualitative and quantitative in nature. Based on the objectives of

the study, data are collected through mixed methods which are social survey and Focus Group Discussion (FGD) including the Key Informants Interview (KII) method. Data were collected from the selected heads of households. A questionnaire was used in collecting data. In this study, the crop sub-sector has been given priority to understand and realise agricultural production.

According to the social survey method firstly, total households were identified based on occupation. Secondly, 33 per cent of households from each occupation were selected for the collection of data by using a sampling technique. A total of 265 (two hundred sixty-five)

households were selected for the collection of data that were selected based on the guide to minimum sample size (95% confidence level, +/- 5% margin of error) by the direction of Krejcie and Morgan (1970) chart who mentioned the population size and its sample size. Three generations were considered to identify the problems of agricultural production.

Problems of Agricultural Production:

Change of Ownership:

Change of ownership in agricultural production is found in the study area in different ways which was increased day by day.

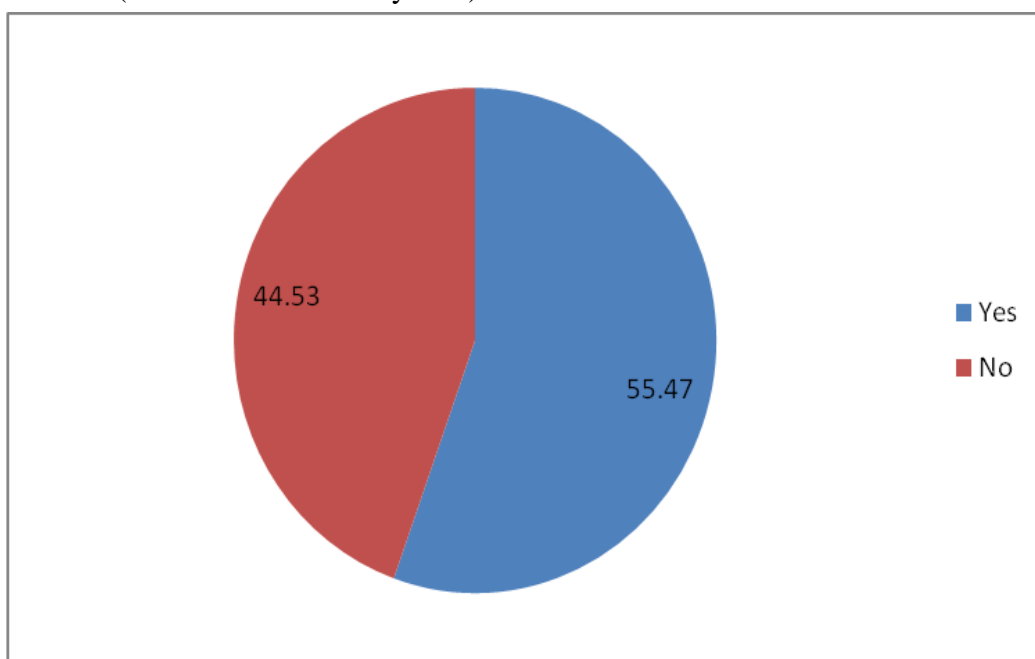


Figure 1: Change of Ownership

30 years ago, landowner cultivated their land and very few amounts of land were cultivated by the non-owner. Now many landowners are not interested in cultivating their land due to old age, lack of opportunities, not presenting their children at home etc. So, non-owners were getting a chance to cultivate the land from the landowner and become financially solvent. In this case most of the time the laborer class takes this opportunity. Besides these marginal farmers who have strength become interested in cultivating the crops through a lease or mortgage system.

Cultivation at Present:

At present high yielding varieties (HYV) and modern varieties (MV) of *boro* are producing more, besides these, maize, wheat, and jute are produced in the study area. Those who produced *boro* rice can be able to produce that. Those who produce maize can produce either *amon* rice or jute after harvesting maize. Those who produce wheat can produce either *amon* rice or jute after harvesting wheat. Now HYV *boro* is produced more than helping to change agricultural production. Those who have more than one-acre arable land, they produce multiple crops. Irri-29, and *Minicate* are produced more due to production more per acre and sale value per mound. Teg production is increasing day by day due to

production and profit. Respondents were familiar with HYV and MV. Respondents were experienced and skilled in producing such varieties despite traditional species of agricultural production. Though 30 years ago traditional agriculture was produced more and was less profitable. Now HYV and MV produced that

resulting in more profit of the respondents. The expenditure and net profit of the respondents depend on their production skill and sale period.

Cultivation Method:

A remarkable change is found in cultivation methods due to use of modern inputs.

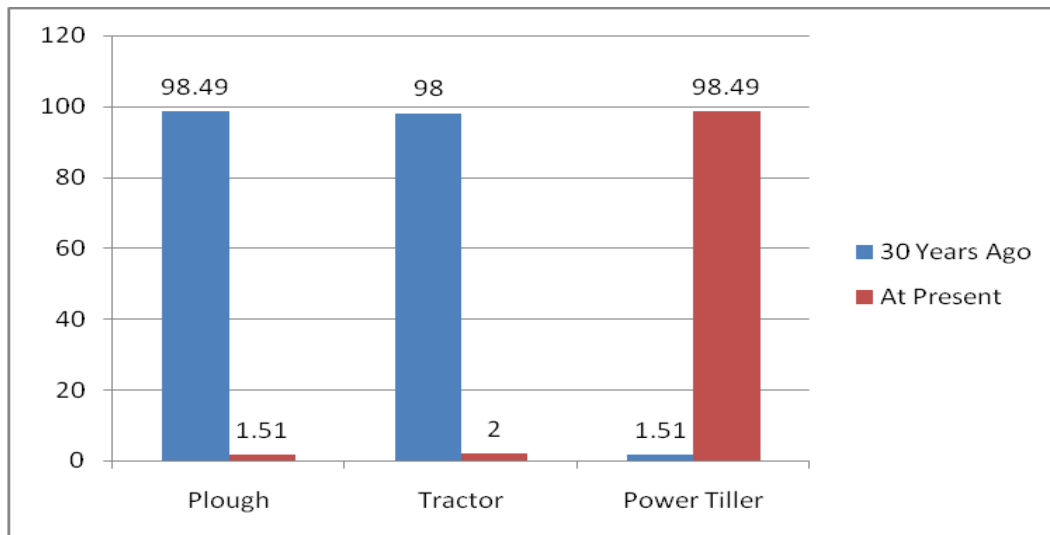


Figure 2: Cultivation Methods

30 years ago, most of the respondents used plough in the study area. The tractor was used widely after the plough and before the invention of the power tiller. At present very, few respondents use ploughs for their cultivation. Most of the respondents use power tiller. Normally, the plough is time-consuming and expensive which is why respondents are not interested in cultivating their land through plough. On the other hand, agricultural land is fragmented which creates obstacles to moving the tractor, besides, it is expensive to purchase. Power tiller is comparatively cheaper and faster to cultivate the land.

Problems of Cultivation Method

Respondents expressed their opinion that some problems with cultivation methods are hindering agricultural production. In the study area, all the respondents are using a power tiller for their cultivation but most of the respondents do not have their power tiller. As a result, they did not receive it in time. The hiring price has been increased impacting production costs. The increasing hiring price is caused by the increasing

price of diesel. Depth digging helped to produce more, but this was not sufficient by the power tiller. Land fragmentation was another problem in the cultivation process due to the moving of power tiller. These problems have been influenced by agricultural production.

Table no. 01: Problems of cultivation method

Problems	Frequency	Percentage
Not getting in time	68	25.66
The high price of hiring	58	21.89
Increasing the price of diesel	55	20.75
Not sufficient depth	49	18.49
Land fragmentation	35	13.21
Total	265	100.00

Irrigation System:

Irrigation was very important for agricultural production, especially for high-yielding varieties (HYVs).

Table no. 02: Irrigation system

Irrigation System	30 years before	At Present
Open water + Doan	36 (13.58)	---
River water + Shewti	40 (15.09)	---
River + Power pump	44 (16.60)	---
Open water + Shallow machine	75 (28.31)	---
River + Shallow machine	70 (26.42)	27 (10.19)
Deep tube well + Shallow machine	---	193 (72.84)
Deep tube well + Electric mortar	---	45 (16.98)
Total	265 (100.00)	265 (100.00)

There was a change found in the irrigation system from 30 years ago to at present. At first irrigation system was *Doan* (made of wood) which was used in open water and was time-consuming. Some used *Shewti* (made of tin) in rivers or open water which was also time-consuming. Beginning of the 80 decades power pump was introduced in irrigation systems that supplied water from the river. It was a revolution in the irrigation system that covered large amounts of land. Beginning in the late 80s decades shallow machine was introduced and were cheaper than power pumps which supplied water from the open water and river as well. Those who were financially capable bought such machines and the government also supplied shallow machines through banks by loan to the rural farmers. At present shallow machines and deep tube wells are popular with the respondents. Very few have the opportunity to collect water from the river by shallow machine. Now someone used an electric mortar with a deep tube well to supply the water. 47.92 per cent of respondents have ownership in the irrigation system and 52.08 per cent have no ownership in the irrigation system and are hired from others by paying money per acre. This hiring system was not a problem due to well known to each other which helped to enhance social relationships among the respondents.

Problems of Irrigation System

Some problems created obstacles in the irrigation system due to various issues in the study area.

Table no. 03: Problems of irrigation system

Problems	Frequency (F)	Percentage (%)
Decline ground water level	56	21.13
Dry river	41	15.47
Electricity crisis	5	1.89
Bore damage	31	11.70
Machine damage	40	15.09
Increasing diesel price	41	15.47
Drought	51	19.25
Total	265	100.00

The decline in groundwater level was reported as a crucial problem of the irrigation system especially in the month of March to mid-May and this problem has been increasing year after year. As a result, it was too hard to supply water during the period. Most of the time the river dried creating obstacles in collecting surface water. Those who used electric mortar, they faced electricity crisis that also impact on irrigation. During ground water depletion bore of deep tube well became damage that was activated after re-boring the deep tube well. Decline ground water level created pressure on shallow machine that resulted to damage the machine. Increasing diesel price created problem in using machine properly. Mixing water into diesel that was also reported as a cause of machine damage. Drought created pressure on shallow machine through declining ground water level.

Problems of Seed

The seed was a very important input for agricultural production, so any problems of seed played a significant role in the amount and cost of production.

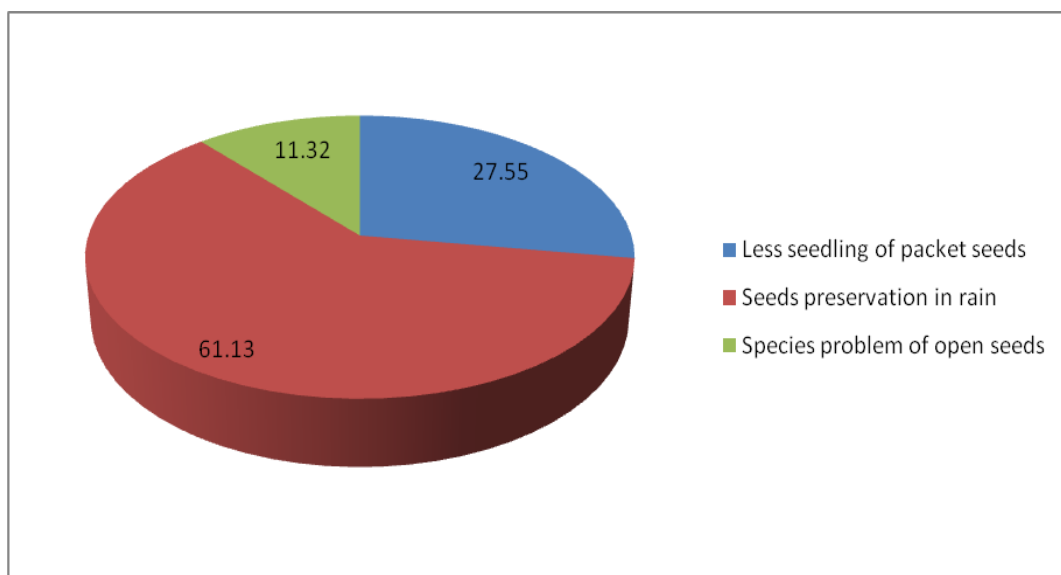


Figure 3: Problems of seeds

Data show that less seedling of packet seeds was a problem that increased production costs and the unavailability of plants. In the rainy season, seed preservation was too hard for the next year. An open seed that was without a packet created problems in identifying the species of the respective crops. As a result, sometimes respondents were cheated for buying open seeds. The respondents gave their opinion regarding the problems of seeds in which fewer seedlings of packet seeds 27.55 per cent, seeds preservation in rain is 61.13 per cent and species problem of open seeds 11.32 per cent.

Use of Fertiliser:

Chemical fertiliser was used in agricultural activities that depended on the fertility of land and land size. In the study area urea was more used in the agricultural production in both rice and other crops. Urea, TSP and Potash were used in the rice production where urea, DAP and potash were used in the wheat production. Chemical fertiliser was used more than 30 years ago due to decreasing soil fertility and a lack of awareness among the respondents. The ratio of Urea, TSP and Potash was almost 3:2:1. The use of chemical fertilisers increased day by day with decreasing soil fertility which increased the cost of agricultural production. Nobody uses organic fertiliser due to the unavailability of organic fertiliser and think less important than chemical fertiliser for agricultural production purposes.

Problems of Using Chemical Fertilisers:

Respondents faced some problems in using chemical fertiliser which was almost common in the rural areas of Bangladesh.

Table no. 04: Problems of using chemical fertiliser

Problems	Frequency (F)	Percentage (%)
Low production for overuse	37	13.96
Decreasing soil fertility	62	23.40
Increasing demand each year	41	15.47
Decreasing qualities	37	13.96
Wants to get in time	29	10.94
Lack of training	59	22.27
Total	265	100.00

The table shows that production was decreased for overuse of chemical fertiliser. Someone tried to produce more through using overuse of chemical fertiliser. As a result, soil fertility decreased day by day which also affected low production per acre. The demand for chemical fertiliser increased each year but quality decreased. In some cases,

wants to receive in time were found due to the financial crisis of the respondents. Lack of training was another problem in using chemical fertilisers that created problems in agricultural production and health. Proper training could ensure the perfect use of chemical fertiliser in crop production.

Use of Pesticide

Usually, pesticides are used for controlling and preventing insects. Recently it has been used for various purposes such as destroying grass, scorpions (local name *Kakara*) and so on. Table 05 shows that pesticides like *jubash*, *amakin*, *amaraj*, *serium* and *seor* were used in agricultural production. Jubash and Amakin were used in killing scorpions. The scorpion was very harmful to crops and destroyed by cutting the roots of the crops. *Amaraj*, *serium* and *seor* were used in destroying grass. As a result, it saved labourer costs in agricultural production. Pesticide was less used in previous ties.

Table no. 05: Using pesticides

Pesticides		Frequency (F)	Percentage (%)
Name	Use per acre (gm)		
Jubash	150	58	21.87
Amakin	150	57	21.52
Amaraj	300	51	19.25
Serium	300	55	20.75
Seor	300	44	16.61
Total		265	100.00

At present it is widely used in crop production, so the use rate has increased day by day. The above-mentioned company dealers come to the respondents and propagate about their pesticides that helped to use pesticides widely. Most of the respondents mentioned that it was quite

impossible to produce crops without using pesticides and pesticides were part and parcel of agricultural production in the study area.

Problems of Using Pesticide:

Pesticides could increase agricultural productivity, but when handled improperly, it was toxic to humans and other species.

Table no. 06: The problems of using pesticides

Problems	Frequency (F)	Percentage (%)
Wants of qualities	37	13.96
Using careless	41	15.47
Vomiting	35	13.21
Feel dizzy	31	11.70
Over swatting	28	10.57
Bound to use each year	45	16.98
Decreasing earth-warm	48	18.11
Total	265	100.00

Most of the respondents used pesticides and did not take proper safety precautions because they had no realization in this regard. Respondent’s perceptions of appropriate pesticide use varied with the setting and culture. Few pesticides have wants qualities that are less activated in killing insects and destroying the grass. Someone who uses pesticides ignores precautions that create vomiting, dizzy feeling, and over-swatting. Using pesticides was bound to each year. Pesticides hurt the worth-arm and directly kill the worth-arm and other useful insects.

Changing Pattern of Crops Production:

In crop production, there was a change that increased production and made a profit more.

Table no. 07: The changing patterns of crop production

Activities	Before 30 Years	At Present
Seeds preservation	At home	Packet & Open from market
Seed germination	<i>Hari</i> , Pitcher (<i>Kolosh</i>)	Sack (<i>Bosta</i>), Straw on soil
Sow seeds	Natural mud	Clay from dry land
Plant sowing	Without line	With & without line
Weeding	Laborer	Pesticides
Irrigation	River, Pond, Ground water	River, Ground water
Use of pesticides	Less use	More use
Use of fertiliser	Less amount	More amount
Crop cutting	Cutting bottom (<i>Gora</i>)	Cutting top (<i>Aga</i>)
Crop crushing	Drum, <i>Macha</i> , Rubbing	Whooper
Preservation	<i>Chatal</i> , <i>Macha</i> , <i>Bosta</i>	<i>Macha</i> , <i>Chatal</i> , <i>Golaghor</i>

Usually, water, seeds, fertiliser and pesticides were the major components in agricultural production and some activities were completed in terms of such factors. 30 years ago, most of the respondents preserved their seeds at home that were risky in the rainy season. Nowadays it could easily be purchased from the market as an open or packet that was profitable by production for the respondents. Seed germination was in *Hari* or Pitcher (*Kolosh*) 30 years ago and was needed more and hard to dandle. At present sacks (*bosta*) and straw on soil were used in seed germination that produced more seeds at a time and were easy to handle. Sow seeds were onto natural mud, now it was onto clay from dry land. Plant sowing was

without line or accordingly row which created problems with using wider machines and air circulation. At the present plant, sowing was completed with or without line or according to row which was useful to use wider machines and more production. Labourer was the only way to win their land. Now very few cases labourers were used rather than pesticides used in weeding which helped to reduce production costs and minimize the wants of laborers. 30 years ago, rivers, ponds and less use of groundwater were used in irrigation systems that helped to use surface water more and preserved the groundwater. Nowadays very few uses river waters and most of the respondents use groundwater in the study area which creates problems in the summer season and decreases groundwater level. Pesticides were less used but are now used more in amount and compulsory. Chemical fertiliser was used less, now used more and increased day by day which increased production but also decreased the soil fertility. 30 years ago, crops were cutting into the bottom of the crops producing more straw which was used for cows and cooking. Now crops were cut on top of crops reduced straw because of crushing in the whooper machine that crushed more crops in a short time. Drum, *macha* (made of bamboo) and rubbing were used in crop crushing 30 years ago. Now all the respondents except very small farmers used the whooper machine in crushing crops that crushed more crops at a time. Agricultural production was preserved in the *chatal*, *macha* and *bosta* in previous times at present *macha*, *chatal* and *golaghor* (storehouse of rice) is used in the preservation of crop production. It was very clear that vast changes came into agricultural production that created more opportunities and some sort of awareness among the respondents which helped to make more profit.

Problems of More Production:

The study area was familiar with agricultural production and fishing. Agricultural production increased after the Green Revolution, and it continues still but some problems were found in

production. Data show that some problems hinder agricultural production through decreasing soil fertility and are created by the overuse of chemical fertilisers. Overuse of chemical fertiliser caused a decrease in agroecology systems that killed useful insects. Respondents were produced from generation to generation who had no training in crop production. As a result, a lack of respondent awareness was found in using chemical fertilisers, pesticides and so on.

Table no. 08: The problems of more production

Problems	Frequency (F)	Percentage (%)
Decreasing soil fertility	45	16.98
Decreasing agro-ecology system	33	12.45
Lack of respondent's awareness	30	11.32
Lack of quality seeds	35	13.21
Lack of quality fertiliser	37	13.96
Declining ground water level	48	18.12
Load shedding	6	2.26
Financial crisis	9	3.40
Lack of training	22	8.30
Total	265	100.00

Quality seeds were a problem for production. In many cases, a lack of qualities was found in packet seeds in growing plants. Sometimes the quality of chemical fertiliser was not at a satisfactory level which was an obstacle for production. The declining groundwater level was a serious problem in agricultural production because of increasing production costs, creating pressure on the shallow machine and damaging the borehole system. Load shedding was another

problem for the respondents especially those who were dependent on electric mortar. The agricultural production rate per acre and price of crops were not the same each year which created a financial crisis which made obstacles in purchasing agricultural production materials in time.

Conclusion:

Agriculture still is the main source of income hence more agricultural production is desired by the respondents in the study area. Agricultural production usually starts in the month of December and ends in May. It depended on environmental conditions. A noteworthy change is found in the cultivation method. Though there is some easy access to some agricultural tools, some are difficult to manage. Most of the respondents fulfil their domestic food demand through their production and sale surplus production. The irrigation system has been developed because of using technology, but there are some problems due to the scarcity of resources of water. Packet seeds are comparatively better but, in some cases, it creates problems in plant growth. Dependency on chemical fertiliser has been increased that is diminished soil fertility despite more production. The use of pesticides has been seriously augmented which creates problems for health and causes environmental pollution as well. The changing pattern of agricultural production is vividly clear in many cases from preparing land to crop crushing and preservation. Some measures like reducing the use of groundwater, swelling the use of surface water; providing quality seed and fertiliser, soil tests regularly, creation of awareness on using pesticides and providing easy loans should be taken for the development of agricultural production that will help the respondents and country people as well.

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