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Trends Of Rice Production In Northern Region Of Bangladesh

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ABSTRACT

In Bangladesh, food security is equivalent to rice security. Rice production in Bangladesh commands vast economic significance across multiple sectors and socioeconomic factors. Rice is Bangladesh's primary crop and staple food, dominating agricultural production, employment, nutritional intake, and contributing substantially to national income. Rice is cultivated in three seasons namely Aus, Aman and Boro throughout the year. Bangladesh ranks as the third-largest producer of rice globally, reaching about 39.1 million tonnes in 2023. However the present study has conducted to analyze the trend of actual yield of rice in Northern Bangladesh for different rice varieties and to provide policy recommendations. The study was documentary analysis type. Data and information were collected from secondary sources. Data and information were collected from books, research reports, journals, different websites and internet. The study was conducted by taking secondary data of 16 districts were collected from Department of Agricultural Extension (DAE), the districts were Bogura, Joypurhat, Pabna, Sirajgonj, Rajshahi, Naogaon, Natore, Chapai Nawabgonj, Rangpur, Gaibandha, Kurigram, Nilphamari, Lalmonirhat, Dinajpur, Thakurgaon and Panchagar. Each and every year the cultivation of aus, aman and boro rice of local varieties, high yielding varieties and hybrid varieties are increasing. The mentioned 16 districts are contributing the total cultivation and production in national cultivation and production of rice in Bangladesh. From the result it was found that in the fiscal year 2009–10, total cultivation of aus, aman and boro rice was 3542861 hectares and total production of aus, aman and boro rice was 10727272 metric tones. Bangladesh commenced exporting aromatic rice, with shipments amounting to 663 tonnes. In fiscal year 2014-15, total cultivation of aus, aman and boro rice was 3697561 hectares and total production of aus, aman and boro rice was 12051486 metric tones. In 2014, Bangladesh initiated the export of 50,000 tonnes of non-fragrant coarse rice to Sri Lanka for the first time under a government-to-government deal, priced at \$450 per tonne, driven by strong output and ample government stocks. In fiscal year 2019–20, total cultivation of aus, aman and boro rice was 3721218 hectares and total production of aus, aman and boro rice was 12027389 metric tones. Over subsequent years, the volume of exports increased significantly, reaching 10,879 tonnes in fiscal year 2019–20. Production cost of rice is more in comparison to other crops. So government should take necessary steps so that the prices of inputs (fertilizers, seeds, irrigation, pesticides) of rice production stay very cheap. For this reason government should provide more subsidies in fertilizers, seeds and pesticides. There are shortages of good quality rice seeds. Local rice varieties seeds are available but quality is a problem of local seeds and per hectare production is less than high yielding varieties and hybrid varieties. Per hectare production of hybrid rice seeds is more but very much scarcity of hybrid rice seeds in Bangladesh. The prices of hybrid seeds are more than local rice varieties and high yielding varieties. Hybrid rice varieties are imported from other countries of the world for this reason each and every year Bangladesh spent a lot of foreign currencies. So government should give emphasis to produce high yielding varieties rice. More research and development should be done so that more hybrid rice varieties can be developed in Bangladesh which will save foreign currencies. Government should take more steps so that farmers can get mechanical support to cultivate land, transplant seedlings, harvest rice, thrash and thresh paddy. There are some areas of the study area where flood damages many rice fields so more research should

be done to develop flood tolerant rice varieties. Drought also damages many rice fields so more research should be done to develop drought tolerant rice varieties.

Key words: Rice, Trends, Cultivation, Production, Yield, Aus, Aman, Boro, Local Variety, Fertilizer, Subsidy, High Yielding Variety, Hybrid.

INTRODUCTION

Bangladesh has a tropical climate with considerable variation in climatic parameters, such as temperature and rainfall. The total area of the country is 14.86 million ha (147,570 square kilometers), and the cultivable area is 9.90 million ha. The cropping intensity of the country is 191%. The country receives plenty of rainfall, although it is not evenly distributed across region or season. The average annual rainfall is about 2,320 mm and varies between 1,110 mm in the northwest and 5,690 mm in the northeast (FAO, 2021). The majority of the rain falls between mid-June and September, which is the monsoon season (Fig. 1A). Between November and March, there is relatively little rain, and between April and May, there is pre-monsoon rain with thunderstorms. There are different summer and winter seasons in Bangladesh. Between 35 and 41 degrees Celsius are the typical summertime maximum temperatures in April and May. The highest temperature ever recorded in 60 years was 42.5°C in May of 2014. The colder months are December through February, with typical daily highs of 15-20°C and lows of 10–12°C at night. The north, however, has temperatures below 10°C. Calendar of crop seasons for rice Bangladesh has three distinct rice-growing seasons: aus, aman, and boro. Under rain fed conditions, Aus is the highland rice growing season before the monsoon. After the pre-monsoon shower, aus rice is direct or broadcast seeded in March and April, and it is harvested in July and August (Figure. 1B). Due to the irrigated boro rice's excellent yield potential, certain aus cultivation regions have switched to it. The most common type of rice grown during the monsoon season, notably along the coast, is called aman. Both direct seeding with aus in March and April and transplanting in July and August are methods used to plant aman. November through December is the harvesting months for both kinds.

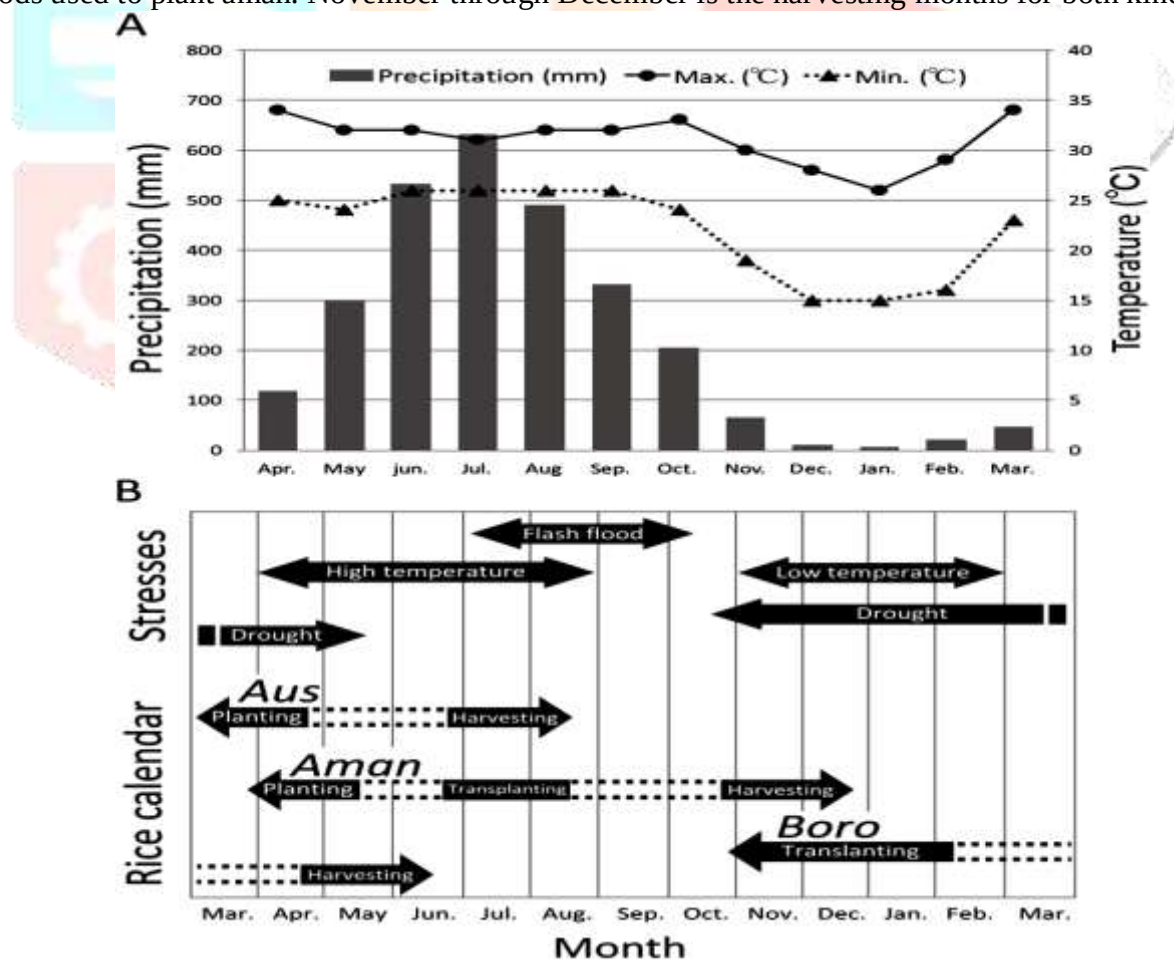


Figure 1: Agro climatic conditions and rice calendar of Bangladesh.

A. The line graph (continuous line) shows monthly maximum temperature (°C) and the broken line shows monthly minimum temperature (°C); the bar graph showing the mean monthly precipitation (mm) throughout the year.

B. The block arrows in the figure 1 indicate the different kinds of stresses induced by the agro climatic parameters throughout the year and the lower block arrows with dashes represents the rice crop calendar of Bangladesh.

The area of aman can, however, be reduced by late floods, and the expanding area of aus can also be diminished by a summer without rain. The dry-season irrigated rice variety known as "boro" is sown from December to early February and harvested from April to June. In the past, boro was grown in extremely low-lying regions with leftover water from the wet season and was manually watered during dry spells using surface water (Fujita, 2010). After the floodwater receded in November, such traditional boro rice was transplanted and harvested in April and May. The modern, high-yielding rice variety IR-8 was introduced into Bangladeshi agriculture in the middle of the 1960s, mainly for boro with irrigation. The boro season in Bangladesh suited many IRRI lines, including BR1, BR3, BR14, BRRI dhan28, and BRRI dhan29. The BRRI scientists combined international elite lines with conventional land races and created numerous dependable varieties, with BR11 being one of the most well-known. However, IRRI cultivars did not perform well in the aman season. Irrigation systems have also been gradually created in Bangladesh since the 1960s. Beginning in the middle of the 1960s and continuing until the middle of the 1970s, surface-water irrigation was done with low-lift pumps. Following this time, the use of shallow tube wells for groundwater irrigation accelerated, greatly increasing the planted area and output of dry-season boro rice throughout the 1980s (Fujita, 2010). Dry-season boro rice became more well-liked with the advent of ground water irrigation systems and the adoption of contemporary high-yielding varieties. Bangladesh's pattern of rice farming has changed; places that were formerly home to the rainfed aus progressively converted to boro agriculture. As a result, each season's contribution to total rice production altered as well. Previously, aman rice supplied a significant amount of the total rice, but boro is now the leading contributor.

The transformation of the rural economy is another element influencing the rise in total rice production due to irrigation and contemporary rice varieties. The Green Revolution took place in adjacent nations in the 1960s and 1970s. Bangladesh's green revolution didn't start until the 1980s, thanks to the quick spread of shallow tube wells used to water contemporary rice types and boro during the dry season. Agricultural wages increased as a result of the rural economy's growth, which was fueled by the Green Revolution's widespread adoption (Fujita, 2010). But according to Hossain et al. (2006), by the years 2001–2002, contemporary rice varieties had covered 65% of the rice-cropped area 80% during the dry season and 51% during the rainy season.

OBJECTIVES OF THE STUDY

The objectives of the study are as follows:

1. To analyze the trend of actual yield of rice in Northern Bangladesh for different rice varieties.
2. To provide policy recommendations.

METHODOLOGY OF THE STUDY

The study was documentary analysis type. Data and information were collected from secondary sources. Data and information were collected from books, research reports, journals, different websites and internet. The study was conducted by taking secondary data of 16 districts from Department of Agricultural Extension (DAE), the districts were Bogura, Joypurhat, Pabna, Sirajgonj, Rajshahi, Naogaon, Natore, Chapai Nawabgonj, Rangpur, Gaibandha, Kurigram, Nilphamari, Lalmonirhat, Dinajpur, Thakurgaon and Panchagar.

DEFINITION OF CONCEPTS

Rice types

Favourable Boro (Short duration): We define Favourable Boro (short duration) rice cultivars grown in the Boro season (dry season) in Favourable environments (no potential abiotic stress excluding natural calamities) having a life span within 145 days.

Favourable Boro (Long duration): Favourable Boro (Long duration) rice type covers rice cultivars of favourable Boro environments (no potential abiotic stress excluding natural calamities) but the life duration of such cultivars is more than 145 days.

Saline (Boro): Saline (Boro) rice cultivars are cultivated in the saline prone coastal part of Bangladesh in the Boro season.

Cold tolerant (Haor): A haor in the north-eastern part of Bangladesh physically is a bowl-shaped shallow depression. It receives surface run-off water during monsoon and becomes vast stretches of turbulent water for several months. This vast stretch becomes suitable for rice cultivation in the Boro season for a short period. Short duration Boro rice varieties having cold tolerance both at vegetative (active tillering stage) and the reproductive phases (pollen mother cell division stage) are ideal for this region.

Cold tolerant (Northern and western): Rice varieties with cold tolerance at the vegetative phase (seedling and active tillering stage) are suitable for Boro cultivation in the northern and western regions of Bangladesh.

Healthier rice (Boro): After getting food sufficiency, Bangladesh is now moving towards producing quality food. As a part of this effort, BRRI is releasing rice varieties rich in micronutrients like iron, zinc, etc. We name these micronutrient and vitamin-rich rice varieties cultivated in the Boro season as healthier rice (Boro).

Favourable Aman: Favourable Aman (FA) is the rain-fed Aman rice ecosystem seemingly having no adverse climatic and soil conditions. This type of rice has a maximum acreage in Bangladesh.

Saline (Aman): Saline (Aman) rice is cultivated in the coastal belt of Bangladesh during Aman season.

Flash flood: The northern regions of Bangladesh often experience a flash flood in the monsoon requiring rice varieties having submergence tolerance for 2-3 weeks during the vegetative phase. Rice varieties having this property fall under flash flood rice.

Drought: The north-western part of Bangladesh is drought-prone and rain-fed rice in those areas face terminal drought frequently. Therefore, drought-tolerant Aman rice cultivars are preferably grown in those areas which are regarded as drought rice.

Tidal submergence: The tidal submergence ecosystem lies in the southern region which is tidal prone and one of the major unfavourable ecosystems of Bangladesh. This ecosystem includes both saline and non-saline conditions. Mostly T. Aman rice is grown in the non-saline areas. Rice with taller seedling height can survive under tidal submergence and hence rice varieties with similar traits are categorized under this type.

Deepwater: Medium-level elongation capacity and lodging tolerance are crucial for surviving in the unfavourable semi-deepwater areas of Manikganj, Cumilla, and Faridpur. Rice cultivars grown in these areas are deepwater rice.

Healthier rice (Aman): We name micronutrient and vitamin-rich rice varieties cultivated in Aman season as healthier rice (Aman).

Upland: Upland rice is also a short-duration (March to July) rain fed ecosystem where seeds are broadcasted in the main rice fields.

T-Aus: T-Aus is a partially rain-fed short duration rice (April to August) where seedlings are transplanted in main rice fields.

Healthier rice (Aus): We name micronutrient and vitamin-rich rice varieties cultivated in the Aus season as healthier rice (Aus).

Premium quality rice: Grain aroma, fine texture, and tastiness provide premium prices in the rice market home and abroad. Therefore, rice with such attributes falls under premium quality rice (PQR).

In order to estimate changing status of target GYP over the decades, first we had to estimate the changing land allocation for rice types over the decades.

RESULTS AND DISCUSSION**Table 1: Estimate of Boro Rice production in M. Ton (Local)**

Sl. No.	Districts	2008-09 Production (M.Ton)	2009-10 Production (M.Ton)	2010-11 Production (M.Ton)	2011-12 Production (M.Ton)	2012-13 Production (M.Ton)	2013-14 Production (M.Ton)	2014-15 Production (M.Ton)
1	Bogura	1229298	1141961	1136592	1174070	1229555	1281099	1221045
2	Joypurhat	438004	449879	466631	469904	490783	500091	471131
3	Pabna	476667	466073	496087	500150	514054	613340	501489
4	Sirajgonj	676148	675328	749235	758967	744180	756497	816737
5	Rajshahi	620739	530432	573729	603251	594892	572134	609983
6	Naogaon	1319994	1323960	1444610	1430824	1513027	1585158	1593963
7	Natore	463811	460827	447492	488040	421781	430111	443618
8	Chapai Nawabgonj	414011	369169	404690	416984	420455	418667	428004
9	Rangpur	804610	861538	848402	887069	947625	998812	1044245
10	Gaibandha	687494	698696	708653	736052	772386	790951	803296
11	Kurigram	548963	571657	620819	626383	636212	651062	662711
12	Nilphamari	574621	546681	579594	596041	625839	608393	662226
13	Lalmonirhat	389883	397153	415853	410326	416321	423453	416249
14	Dinajpur	1295692	1254316	1313989	1282828	1338733	1378409	1360948
15	Thakurgaon	535672	627464	636598	567077	514706	571070	597003
16	Panchagar	375939	352138	382855	393465	403673	399614	418838
Total		1085154	1072727	1122582	1134143	1158422	1197886	1205148
		6	2	9	1	2	1	6

Source: Department of Agricultural Extension (2022)

Estimate of local boro rice production from 2008-09 to 2014-15 has shown in the above table. From the result it was found that each and every year the local boro rice production was maximum in Naogaon district but each and every year the local boro rice production was minimum in Panchagar district. Local boro rice production was maximum in the year 2014-15 which was 12051486 M. Ton and local boro rice production was minimum in the year 2009-10 which was 10727272 M. Ton.

Table 2: Estimate of Boro Rice production in M.Ton (HYV)

Sl. No.	Districts	2008-09 Production (M.Ton)	2009-10 Production (M.Ton)	2010-11 Production (M.Ton)	2011-12 Production (M.Ton)	2012-13 Production (M.Ton)	2013-14 Production (M.Ton)	2014-15 Production (M.Ton)
1	Bogura	517568	568649	554827	566164	631780	654979	589904
2	Joypurhat	153163	163029	194554	209911	213719	231601	211547
3	Pabna	255869	254883	273714	275605	290844	287885	263810
4	Sirajgonj	445206	445969	506219	510658	514062	500782	523685
5	Rajshahi	273235	227421	262696	282943	279472	264453	264032
6	Naogaon	659709	672397	707552	705284	733139	786250	766458
7	Natore	235771	226456	223548	234712	199794	211769	228127
8	Chapai Nawabgonj	191325	166905	188712	200548	197547	195589	179410
9	Rangpur	290336	335344	309835	321213	355743	379690	414764
10	Gaibandha	298033	351390	327365	336229	375426	368836	350125
11	Kurigram	244656	265472	260466	258669	283374	302684	318846
12	Nilphamari	199783	207371	215261	209872	210319	221959	231378
13	Lalmonirhat	130374	122300	119519	122348	125968	133992	128843
14	Dinajpur	493707	485527	553118	564531	623080	646814	638860
15	Thakurgaon	236938	215000	217493	219403	197106	214671	205730
16	Panchagar	97828	119830	153358	146782	141384	146565	136012
Total		4723501	4827943	5068237	5164872	5372757	5548519	5451531

Department of Agricultural Extension (2022)

Estimate of HYV boro rice production from 2008-09 to 2014-15 has shown in the above table. From the result it was found that the local boro rice production was maximum in the year 2013-14 which was 5548519 M. Ton but local boro rice production was minimum in the year 2008-2009 which was 4723501 M. Ton.

Table 3: Estimate of Boro Rice production in M.Ton (HYV)

Sl. No.	Districts	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
		Production (M.Ton)	Production (M.Ton)	Production (M.Ton)	Production (M.Ton)	Production (M.Ton)	Production (M.Ton)
1	Bogura	613753	644940	649928	621646	653759	653557
2	Joypurhat	203139	206130	191944	243795	240046	256621
3	Pabna	262638	231808	217808	199223	206211	227472
4	Sirajgonj	531567	513468	536129	566703	561211	536453
5	Rajshahi	253872	242756	246033	249312	235561	243349
6	Naogaon	760819	721416	763444	773203	771824	768330
7	Natore	232562	233988	269913	271205	249953	241027
8	Chapai Nawabgonj	175380	172559	180058	162459	192506	208974
9	Rangpur	401939	363855	365872	314582	319286	326651
10	Gaibandha	332805	351322	350545	341166	365057	358442
11	Kurigram	324602	318345	325005	324823	281681	274052
12	Nilphamari	231781	214995	275726	186514	167128	166963
13	Lalmonirhat	117863	131251	99148	95556	81856	86846
14	Dinajpur	634384	629667	638111	624733	651036	643033
15	Thakurgaon	209742	203764	207258	183291	182406	182817
16	Panchagar	134516	126834	120854	107505	100208	84375
Total		5421362	5307098	5437776	5265716	5259729	5258962

Source: Department of Agricultural Extension (2022)

Estimate of HYV boro rice production from 2015-16 to 2020-21 in M. Ton has shown in the above table. From the result it was found that the HYV boro rice production was maximum in the year 2017-18 which was 5437776 M. Ton but HYV boro rice production was minimum in the year 2020-21 which was 5258962 M. Ton.

Table 4: Estimate of Boro Rice production in M.Ton (Hybrid)

Sl. No.	Districts	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
		Production (M.Ton)	Production (M.Ton)	Production (M.Ton)	Production (M.Ton)	Production (M.Ton)	Production (M.Ton)	Production (M.Ton)
1	Bogura	263922	177597	138684	123304	98664	98486	94853
2	Joypurhat	125276	127485	100272	90513	96558	81500	71508
3	Pabna	28759	10419	11025	7107	5729	5275	12300
4	Sirajgonj	89678	65895	73068	66532	54726	65108	63485
5	Rajshahi	52939	45299	29797	28628	23361	21898	34787
6	Naogaon	98625	95690	89332	82589	79041	77196	77725
7	Natore	62709	61497	64547	63518	47211	37633	24760
8	Chapai Nawabgonj	5690	1625	1954	1461	857	1245	2600
9	Rangpur	193389	180139	170452	176535	181953	192713	190480
10	Gaibandha	145862	114423	113915	104007	103841	115377	129818
11	Kurigram	107414	111741	116730	111124	108585	106029	95912
12	Nilphamari	111056	94202	94626	104455	108865	109849	127930
13	Lalmonirhat	91886	90530	103428	94843	92395	83650	75848
14	Dinajpur	177733	179888	114303	96212	73438	71064	96504

15	Thakurgao n	46848	57946	50400	41515	21458	30191	44623
16	Panchagar	92516	62475	29958	32954	29712	6462	32520
Total		1694302	1476851	1302491	1225297	1126394	1103676	1175653

Source: Department of Agricultural Extension (2022)

Estimate of hybrid boro rice production from 2008-09 to 2014-15 in M. Ton has shown in the above table. From the result it was found that the hybrid boro rice production was maximum in the year 2008-09 which was 1694302 M. Ton but hybrid boro rice production was minimum in the year 2020-21 which was 1103676 M. Ton.

Table 56: Estimate of Boro Rice production in M.Ton (Hybrid)

Sl. No.	Districts	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
		Production (M.Ton)	Production (M.Ton)	Production (M.Ton)	Production (M.Ton)	Production (M.Ton)	Production (M.Ton)
1	Bogura	86368	72432	75614	85366	66128	64580
2	Joypurhat	87229	87623	85091	46286	30804	22402
3	Pabna	9326	8796	6683	5815	6488	6778
4	Sirajgonj	47343	47778	46728	47305	40711	53096
5	Rajshahi	30583	29945	23518	22880	19106	21951
6	Naogaon	65379	68102	50103	42742	35308	50363
7	Natore	9618	8269	4527	4258	3977	17279
8	Chapai Nawabgonj	2261	3110	3085	2422	2289	4367
9	Rangpur	179517	201831	250994	290366	267245	259947
10	Gaibandha	134204	129071	137373	136997	148198	164101
11	Kurigram	92468	107660	158613	150520	174635	168613
12	Nilphamari	120401	123255	135499	169245	190019	193566
13	Lalmonirhat	70998	66026	79614	82620	97312	105055
14	Dinajpur	91723	77579	78365	56834	57659	77704
15	Thakurgaon	34230	49326	45270	45812	42847	45501
16	Panchagar	24263	20527	23365	32333	31161	35808
Total		1085911	1101330	1204442	1221801	1213887	1291111

Source: Department of Agricultural Extension (2022)

Estimate of hybrid boro rice production from 2015-16 to 2020-21 in M. Ton has shown in the above table. From the result it was found that the hybrid boro rice production was maximum in the year 2020-21 which was 1291111 M. Ton but hybrid boro rice production was minimum in the year 2008-09 which was 1085911 M. Ton.

Table 6: Estimate of Boro Rice production in M.Ton (Local+HYV+hybrid)

Sl. No.	Districts	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
		Production (M.Ton)	Production (M.Ton)	Production (M.Ton)	Production (M.Ton)	Production (M.Ton)	Production (M.Ton)	Production (M.Ton)
1	Bogura	782885	747627	696400	692543	730444	756043	688437
2	Joypurhat	278439	290514	294826	300424	310277	313101	283055
3	Pabna	286172	267512	287189	284993	298243	294646	277632
4	Sirajgonj	537738	515026	582944	580508	571337	569664	591063
5	Rajshahi	326367	272891	292510	311571	302833	286351	298819
6	Naogaon	758334	768087	796884	787873	812180	863446	844183
7	Natore	298569	287990	288242	298320	247123	249564	253141
8	Chapai Nawabgonj	197015	168530	190666	202009	198404	196834	182010
9	Rangpur	483725	515483	480287	497748	537696	572403	605244

10	Gaibandha	443945	466204	441922	440969	479830	484925	480520
11	Kurigram	353901	378907	379119	371557	393727	410475	416497
12	Nilphamari	310839	301573	309887	314327	319184	331808	359308
13	Lalmonirhat	222266	212876	222972	217227	218392	217658	204704
14	Dinajpur	671440	665415	667421	660743	696518	717878	735364
15	Thakurgaon	283786	272946	267893	260918	218564	244862	250353
16	Panchagar	190344	182305	183316	179736	171096	153027	168532
Total		6425765	6313886	6382478	6401466	6505848	6662685	6638862

Source: Department of Agricultural Extension (2022)

Estimate of Boro Rice production in M.Ton (Local+HYV+hybrid) from the year 2008-09 has shown in the above table. From the result it was found that the boro (Local+HYV+hybrid) rice production was maximum in the year 2013-14 which was 6662685 M. Ton but boro (Local+HYV+hybrid) rice production was minimum in the year 2009-10 which was 6313886 M. Ton.

Table 7: Estimate of Boro Rice production in M.Ton (L+HYV+HYB)

Sl. No.	Districts	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
		Production (M.Ton)	Production (M.Ton)	Production (M.Ton)	Production (M.Ton)	Production (M.Ton)	Production (M.Ton)
1	Bogura	702778	719981	728268	709612	721540	719753
2	Joypurhat	290368	293753	277035	290081	270850	279023
3	Pabna	272865	241412	225208	205635	213367	235085
4	Sirajgonj	582925	566275	588606	618878	606362	593982
5	Rajshahi	284455	272701	269551	272192	254667	265300
6	Naogaon	826198	789518	813547	815945	807132	818693
7	Natore	242312	242317	274524	275487	253950	258335
8	Chapai Nawabgonj	177641	175669	183143	164881	194795	213341
9	Rangpur	581456	565686	616866	604948	586531	586598
10	Gaibandha	467757	481240	488840	479311	514341	523836
11	Kurigram	419821	428420	485933	477756	458534	444757
12	Nilphamari	352182	338250	411225	355759	357147	360529
13	Lalmonirhat	188861	197277	178762	178176	179168	191901
14	Dinajpur	726107	707246	716476	681567	708695	720737
15	Thakurgaon	243972	253090	252528	229103	225253	228318
16	Panchagar	158779	147361	144219	139838	131369	120183
Total		6518477	6420196	6654731	6499169	6483701	6560371

Source: Department of Agricultural Extension (2022)

Estimate of Boro Rice production in M.Ton (Local+HYV+hybrid) from the year 2015-16 has shown in the above table. From the result it was found that the boro (Local+HYV+hybrid) rice production was maximum in the year 2017-18 which was 6654731 M. Ton but boro (Local+HYV+hybrid) rice production was minimum in the year 2016-17 which was 6420196M. Ton.

Table 8: Estimate of Total Rice production in M.Ton (Aus+Aman+Boro)

Sl. No.	Districts	2008-09 Production (M.Ton)	2009-10 Production (M.Ton)	2010-11 Production (M.Ton)	2011-12 Production (M.Ton)	2012-13 Production (M.Ton)	2013-14 Production (M.Ton)	2014-15 Production (M.Ton)
1	Bogura	1229298	1141961	1136592	1174070	1229555	1281099	1221045
2	Joypurhat	438004	449879	466631	469904	490783	500091	471131
3	Pabna	476667	466073	496087	500150	514054	613340	501489
4	Sirajgonj	676148	675328	749235	758967	744180	756497	816737
5	Rajshahi	620739	530432	573729	603251	594892	572134	609983
6	Naogaon	1319994	1323960	1444610	1430824	1513027	1585158	1593963
7	Natore	463811	460827	447492	488040	421781	430111	443618
8	Chapai Nawabgonj	414011	369169	404690	416984	420455	418667	428004
9	Rangpur	804610	861538	848402	887069	947625	998812	1044245
10	Gaibandha	687494	698696	708653	736052	772386	790951	803296
11	Kurigram	548963	571657	620819	626383	636212	651062	662711
12	Nilphamari	574621	546681	579594	596041	625839	608393	662226
13	Lalmonirhat	389883	397153	415853	410326	416321	423453	416249
14	Dinajpur	1295692	1254316	1313989	1282828	1338733	1378409	1360948
15	Thakurgaon	535672	627464	636598	567077	514706	571070	597003
16	Panchagar	375939	352138	382855	393465	403673	399614	418838
Total		10851546	10727272	11225829	11341431	11584222	11978861	12051486

Source: Department of Agricultural Extension (2022)

Estimate of total rice (Aus+Aman+Boro) production in M.Ton has shown in the above table. The result revealed that rice production was maximum in the year 2014-15 which was 12051486 M. Ton but total rice(Aus+Aman+Boro) production was minimum in the year 2009-10 which was 10727272 M. Ton.

Table 9: Estimate of Total Rice production in M.Ton (Aus+Aman+Boro)

Sl. No.	Districts	2015-16 Production (M.Ton)	2016-17 Production (M.Ton)	2017-18 Production (M.Ton)	2018-19 Production (M.Ton)	2019-20 Production (M.Ton)	2020-21 Production (M.Ton)
1	Bogura	1236451	1261352	1232886	1234994	1278004	1326254
2	Joypurhat	490671	495876	475870	508679	486595	474277
3	Pabna	493105	463675	466906	433180	427926	468804
4	Sirajgonj	803882	772255	793742	834171	845801	771333
5	Rajshahi	606450	583485	600255	600454	592016	623293
6	Naogaon	1552191	1520927	1422096	1439413	1468694	1496570
7	Natore	439619	453223	476556	484974	467271	490503
8	Chapai Nawabgonj	433519	433262	452626	446275	430001	495130
9	Rangpur	1054638	1049895	1126709	1141918	1142531	1100055
10	Gaibandha	764356	774685	808221	835228	871813	884717
11	Kurigram	666657	678411	792063	796068	773842	771006
12	Nilphamari	650230	640208	730039	695872	628258	672570
13	Lalmonirhat	420261	430991	430323	431369	448204	437162
14	Dinajpur	1378791	1362870	1452196	1472046	1516231	1441426
15	Thakurgaon	627372	639685	679998	658546	661852	643076
16	Panchagar	411104	405160	415274	426863	393810	434283
Total		12029297	11965960	12355760	12440050	12432849	12530459

Source: Department of Agricultural Extension (2022)

Estimate of total rice (Aus+Aman+Boro) production in M.Ton has shown in the above table. The result revealed that rice production was maximum in the year 2020-21 which was **12530459** M. Ton but total rice(Aus+Aman+Boro) production was minimum in the year 2016-17 which was 11965960M. Ton.

Table 10: Estimate of Total Rice (Aus+Aman+Boro) cultivation area

Sl. No.	Districts	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
		Area (Hectares)	Area (Hectares)	Area (Hectares)	Area (Hectares)	Area (Hectares)	Area (Hectares)	Area (Hectares)
1	Bogura	395561	382919	392263	394370	389272	394301	394130
2	Joypurhat	137603	138539	137928	137646	138505	136445	136457
3	Pabna	178620	184722	185957	176985	179310	172453	179254
4	Sirajgonj	207365	216617	217996	220754	220381	221442	234334
5	Rajshahi	198327	177995	186013	192950	181773	178145	180270
6	Naogaon	405959	408863	439617	444814	448240	447138	467889
7	Natore	149304	146415	141843	148067	139713	138683	135926
8	Chapai Nawabgonj	149886	141070	146203	151166	144102	145661	146414
9	Rangpur	263987	272176	267058	278078	288814	289627	293891
10	Gaibandha	219860	232034	232629	234834	233502	240080	250393
11	Kurigram	187164	193443	200052	202744	198370	205543	205586
12	Nilphamari	183766	182925	187184	185650	190372	188163	188868
13	Lalmonirhat	132057	130376	126008	128606	131107	131060	128428
14	Dinajpur	430106	425864	425227	427006	422948	425572	433504
15	Thakurgaon	172670	181412	183435	184624	181834	184065	188523
16	Panchagar	133985	127491	127703	133003	137241	134040	133694
Total		3546220	3542861	3597116	3641297	3625484	3632418	3697561

Source: Department of Agricultural Extension (2022)

Estimate of total rice (Aus+Aman+Boro) cultivation area from 2008-09 to 2014-15 has shown in the above table. The result revealed that in the year 2014-15 the total rice (Aus+Aman+Boro) cultivation area was 3697561 hectares which was maximum but in the year 2016-17 the total rice (Aus+Aman+Boro) cultivation area was 3641297 hectares which was minimum.

Table 11: Estimate of Total Rice (Aus+Aman+Boro) Area

Sl. No.	Districts	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
		Area (Hectares)	Area (Hectares)	Area (Hectares)	Area (Hectares)	Area (Hectares)	Area (Hectares)
1	Bogura	389040	385768	370468	381723	394303	395976
2	Joypurhat	138033	138758	138956	147044	147062	138135
3	Pabna	174936	166263	658018	159237	140027	168258
4	Sirajgonj	229443	221777	226864	233443	232959	231992
5	Rajshahi	181753	176580	187358	187035	186089	183299
6	Naogaon	460018	447427	422348	412612	414335	440165
7	Natore	134604	136406	140202	146172	144096	143956
8	Chapai Nawabgonj	150169	145472	148537	150847	136006	150431
9	Rangpur	301629	305621	321229	316557	315769	321887
10	Gaibandha	237131	239452	244006	251780	263519	263105
11	Kurigram	205084	209537	233857	231211	227107	233338
12	Nilphamari	189581	188789	213380	196295	186910	197245
13	Lalmonirhat	132520	130891	137398	133839	139059	134319
14	Dinajpur	438957	434921	439408	437333	457390	446803
15	Thakurgaon	199324	197223	218834	208199	216893	213299
16	Panchagar	131232	128195	133078	130357	119694	134131
Total		3693454	3653080	4233941	3723684	3721218	3796339

Source: Department of Agricultural Extension (2022)

Estimate of total rice (Aus+Aman+Boro) cultivation area from 2015-16 to 2020-21 has shown in the above table. The result revealed that in the year 2017-18 the total rice (Aus+Aman+Boro) cultivation area was 4233941 hectares which was maximum but in the year 2016-17 the total rice (Aus+Aman+Boro) cultivation area was 3653080 hectares which was minimum.

Table 12: Estimate of Boro Rice (HYV) Area

Sl. No.	Districts	2008-09 Area (Hectares)	2009-10 Area (Hectares)	2010-11 Area (Hectares)	2011-12 Area (Hectares)	2012-13 Area (Hectares)	2013-14 Area (Hectares)	2014-15 Area (Hectares)
1	Bogura	135502	147875	155589	158727	162460	167000	170998
2	Joypurhat	42027	43331	49155	50650	50856	52441	50740
3	Pabna	63001	64835	64636	65973	68561	68324	65900
4	Sirajgonj	113168	119764	118354	120799	124012	124180	124779
5	Rajshahi	68650	62356	67106	70924	70249	68952	65955
6	Naogaon	165138	168586	169633	173423	177892	177917	187996
7	Natore	56600	53934	48833	50831	48762	49448	50577
8	Chapai Nawabgonj	49718	48550	50071	52862	50333	50415	48145
9	Rangpur	80543	88028	91953	94888	94713	95729	97329
10	Gaibandha	79135	89784	90170	95174	95364	95731	97831
11	Kurigram	62117	67751	68142	70638	70221	74596	79832
12	Nilphamari	53705	55374	56657	57588	57175	57720	55867
13	Lalmonirhat	34001	30878	30169	32534	34236	34612	33904
14	Dinajpur	136856	134623	148908	151417	155861	159588	158492
15	Thakurgaon	56394	52771	55014	56232	57598	56861	54400
16	Panchagar	26046	32373	39426	40144	37550	38850	34533
Total		1222601	1260813	1303816	1342804	1355843	1372364	1377278

Source: Department of Agricultural Extension (2022)

Estimate of total boro rice (HYV) cultivation area from 2008-09 to 2014-15 has shown in the above table. The result revealed that in the year 2014-15 the total boro rice (HYV) cultivation area was 1377278 hectares which was maximum but in the year 2008-09 the total boro rice (HYV) cultivation area was 1222601 hectares which was minimum.

Table 13: Estimate of Boro Rice (HYV) Area

Sl. No.	Districts	2015-16 Area (Hectares)	2016-17 Area (Hectares)	2017-18 Area (Hectares)	2018-19 Area (Hectares)	2019-20 Area (Hectares)	2020-21 Area (Hectares)
1	Bogura	170176	170454	170607	168866	167993	167884
2	Joypurhat	49049	49727	49735	60621	64036	63619
3	Pabna	66064	58309	544446	52989	49913	52372
4	Sirajgonj	126824	125971	127520	128236	128713	125130
5	Rajshahi	64306	61134	64615	63433	62000	60645
6	Naogaon	188317	178646	189312	179308	177204	174930
7	Natore	51666	51021	58349	60585	57644	56483
8	Chapai Nawabgonj	47534	45451	46389	44942	46112	46933
9	Rangpur	95143	90870	91143	81532	81658	84015
10	Gaibandha	94451	98140	94407	92815	95851	92806
11	Kurigram	80345	82626	82190	79011	72638	71611
12	Nilphamari	56215	54612	68185	47455	43079	42739
13	Lalmonirhat	31945	33823	27977	26800	22119	21973

14	Dinajpur	159572	160471	158961	158103	160302	157601
15	Thakurgaon	55326	50983	58882	49603	50038	49650
16	Panchagar	34722	31756	30252	26404	24196	23065
Total		1371655	1343994	1862970	1320703	1303496	1291456

Source: Department of Agricultural Extension (2022)

Estimate of total boro rice (HYV) cultivation area from 2015-16 to 2020-21 has shown in the above table. The result revealed that in the year 2017-18 the total boro rice (HYV) cultivation area was 1862970hectares which was maximum but in the year 2020-21 the total boro rice (HYV) cultivation area was 1291456hectares which was minimum.

Table 14: Estimate of Boro Rice (Hybrid) Area

Sl. No .	Districts	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
		Area (Hectares)	Area (Hectares)	Area (Hectares)	Area (Hectares)	Area (Hectares)	Area (Hectares)	Area (Hectares)
1	Bogura	52597	38936	29458	25090	21561	18601	17400
2	Joypurhat	27521	27521	20643	18966	19762	16540	18458
3	Pabna	5685	2173	2104	1440	1123	1153	2641
4	Sirajgonj	19801	12673	13998	12805	11777	12130	12139
5	Rajshahi	10435	8822	5853	5578	4465	4184	6502
6	Naogaon	19262	17559	17105	16590	15036	14734	14731
7	Natore	13031	12109	12217	11521	9221	7136	4496
8	Chapai Nawabgonj	1163	365	431	316	184	303	600
9	Rangpur	42596	39366	35966	37417	37516	38434	37822
10	Gaibandha	32585	25005	24417	22601	22061	23556	26073
11	Kurigram	26275	24931	24271	23548	21804	21232	20191
12	Nilphamari	22644	20682	20198	22965	24082	24977	26317
13	Lalmonirhat	21889	21025	22004	20814	19127	18652	16920
14	Dinajpur	39380	41565	27217	22597	16352	14896	20514
15	Thakurgaon	11867	11474	9045	7263	5160	6655	9339
16	Panchagar	20448	14111	6396	6622	5418	1344	6703
Total		367179	318317	271323	256133	234649	224527	240846

Source: Department of Agricultural Extension (2022)

Estimate of total boro rice (Hybrid) cultivation area from 2008-09 to 2014-15 has shown in the above table. The result revealed that in the year 2008-09 the total boro rice (Hybrid) cultivation area was 367179hectares which was maximum but in the year 2013-14 the total boro rice (Hybrid) cultivation area was 224527hectares which was minimum.

Table 15: Estimate of Boro Rice (Hybrid) Area

Sl. No.	Districts	2015-16 Area (Hectares)	2016-17 Area (Hectares)	2017-18 Area (Hectares)	2018-19 Area (Hectares)	2019-20 Area (Hectares)	2020-21 Area (Hectares)
1	Bogura	16088	13808	14861	15544	16944	16613
2	Joypurhat	18506	18300	18300	10224	6933	5007
3	Pabna	2038	1722	1424	1297	1513	1603
4	Sirajgonj	9298	9687	9380	9743	9793	13123
5	Rajshahi	5766	5584	4560	4654	4154	4696
6	Naogaon	12348	13363	9694	8705	7131	10462
7	Natore	1758	1568	841	811	758	3496
8	Chapai Nawabgonj	511	690	690	569	522	957
9	Rangpur	36652	41926	50550	53148	51343	48069
10	Gaibandha	27246	26704	30123	30592	33018	36442
11	Kurigram	19390	23214	33810	33220	39575	39169
12	Nilphamari	24863	25796	32981	35956	40322	40019
13	Lalmonirhat	15773	14052	19874	18743	22499	24206
14	Dinajpur	17949	16039	16329	11936	12341	16395
15	Thakurgaon	7028	8981	8647	9080	8340	8972
16	Panchagar	4973	4268	5056	7025	6938	8300
Total		220187	225702	257120	251247	262124	277529

Source: Department of Agricultural Extension (2022)

Estimate of total boro rice (Hybrid) cultivation area from 2015-16 to 2020-21 has shown in the above table. The result revealed that in the year 2020-21 the total boro rice (Hybrid) cultivation area was 277529hectares which was maximum but in the year 2015-16 the total boro rice (Hybrid) cultivation area was 220187hectares which was minimum.

Table 16: Estimate of Boro Rice (LV+HYV+HYB) Area

Sl. No.	Districts	2008-09 Area (Hectare s)	2009-10 Area (Hectare s)	2010-11 Area (Hectare s)	2011-12 Area (Hectare s)	2012-13 Area (Hectare s)	2013-14 Area (Hectare s)	2014-15 Area (Hectare s)
1	Bogura	188889	187516	186578	185371	184021	186796	190138
2	Joypurhat	69548	70852	69798	69616	70618	68981	69198
3	Pabna	70223	68413	68037	68561	70605	70310	69401
4	Sirajgonj	135064	134417	134632	135716	137424	138551	139102
5	Rajshahi	79161	71246	72966	76502	74714	73136	72457
6	Naogaon	184400	186145	186738	190013	192928	192651	202727
7	Natore	69680	66063	61125	62396	58030	56643	55171
8	Chapai Nawabgonj	50881	48915	50502	53178	50517	50718	48745
9	Rangpur	123139	127394	127919	132305	132229	134163	135151
10	Gaibandha	111756	115040	115018	118280	117761	119707	124247
11	Kurigram	89594	93772	93617	95342	93182	96923	101042
12	Nilphamari	76349	76056	76855	80553	81257	82697	82184
13	Lalmonirhat	55894	51927	52186	53368	53379	53274	50831
14	Dinajpur	176236	176188	176125	174014	172213	174484	179006
15	Thakurgaon	68261	64245	64059	63495	62758	63516	63739
16	Panchagar	46494	46484	45822	46766	42968	40194	41236
Total		1595569	1584673	1581977	1605476	1594604	1602744	1624375

Source: Department of Agricultural Extension (2022)

Estimate of total boro rice (LV+HYV+HYB) cultivation area from 2008-09 to 2014-15 has shown in the above table. The result revealed that in the year 2014-15 the total boro rice (LV+HYV+HYB) cultivation area was 1624375hectares which was maximum but in the year 2010-11 the total boro rice (Hybrid) cultivation area was 1581977hectares which was minimum.

Table 17: Estimate of Boro Rice (LV+HYV+HYB) Area

Sl. No.	Districts	2015-16 Area (Hectares)	2016-17 Area (Hectares)	2017-18 Area (Hectares)	2018-19 Area (Hectares)	2019-20 Area (Hectares)	2020-21 Area (Hectares)
1	Bogura	187734	185741	187013	185914	185882	185375
2	Joypurhat	67555	68027	68035	70845	70969	68626
3	Pabna	68665	60555	546317	54658	51837	54430
4	Sirajgonj	138125	137922	139339	140288	140603	140495
5	Rajshahi	70072	66718	69175	68087	66154	65341
6	Naogaon	200665	192009	199006	188013	184335	185392
7	Natore	53478	52614	59224	61407	58412	59994
8	Chapai Nawabgonj	48045	46141	47079	45511	46634	47890
9	Rangpur	131795	132796	141693	134680	133001	132084
10	Gaibandha	122209	125368	125098	124074	129504	130009
11	Kurigram	101392	107031	117320	113481	113521	111989
12	Nilphamari	81078	80408	101166	83411	83401	82758
13	Lalmonirhat	47718	47875	47851	45543	44618	46179
14	Dinajpur	177521	176510	175290	170039	172643	173996
15	Thakurgaon	62354	59964	67529	58683	58378	58622
16	Panchagar	39695	36024	35308	33429	31134	31365
Total		1598101	1575703	2126443	1578063	1571026	1574545

Source: Department of Agricultural Extension (2022)

Estimate of total boro rice (LV+HYV+HYB) cultivation area from 2015-16 to 2020-21 has shown in the above table. The result revealed that in the year 2017-18 the total boro rice (LV+HYV+HYB) cultivation area was 2126443hectares which was maximum but in the year 2019-20 the total boro rice (Hybrid) cultivation area was 1571026hectares which was minimum.

Table 18: Estimate of Total Rice (Aus+Aman+Boro) Area

Sl. No.	Districts	2008-09 Area (Hectares)	2009-10 Area (Hectares)	2010-11 Area (Hectares)	2011-12 Area (Hectares)	2012-13 Area (Hectares)	2013-14 Area (Hectares)	2014-15 Area (Hectares)
1	Bogura	395561	382919	392263	394370	389272	394301	394130
2	Joypurhat	137603	138539	137928	137646	138505	136445	136457
3	Pabna	178620	184722	185957	176985	179310	172453	179254
4	Sirajgonj	207365	216617	217996	220754	220381	221442	234334
5	Rajshahi	198327	177995	186013	192950	181773	178145	180270
6	Naogaon	405959	408863	439617	444814	448240	447138	467889
7	Natore	149304	146415	141843	148067	139713	138683	135926
8	Chapai Nawabgonj	149886	141070	146203	151166	144102	145661	146414
9	Rangpur	263987	272176	267058	278078	288814	289627	293891
10	Gaibandha	219860	232034	232629	234834	233502	240080	250393
11	Kurigram	187164	193443	200052	202744	198370	205543	205586
12	Nilphamari	183766	182925	187184	185650	190372	188163	188868
13	Lalmonirhat	132057	130376	126008	128606	131107	131060	128428
14	Dinajpur	430106	425864	425227	427006	422948	425572	433504
15	Thakurgaon	172670	181412	183435	184624	181834	184065	188523
16	Panchagar	133985	127491	127703	133003	137241	134040	133694
Total		3546220	3542861	3597116	3641297	3625484	3632418	3697561

Source: Department of Agricultural Extension (2022)

Estimate of total rice (Aus+Aman+Boro) area from 2008-09 to 2014-15 has shown in the above table. The result revealed that in the year 2014-15 the total rice (Aus+Aman+Boro) cultivation area was 3697561hectares which was maximum but in the year 2009-10 the total rice (Aus+Aman+Boro) cultivation area was 3542861hectares which was minimum.

Table 19: Estimate of Total Rice (Aus+Aman+Boro) Area

Sl. No.	Districts	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
		Area (Hectares)	Area (Hectares)	Area (Hectares)	Area (Hectares)	Area (Hectares)	Area (Hectares)
1	Bogura	389040	385768	370468	381723	394303	395976
2	Joypurhat	138033	138758	138956	147044	147062	138135
3	Pabna	174936	166263	658018	159237	140027	168258
4	Sirajgonj	229443	221777	226864	233443	232959	231992
5	Rajshahi	181753	176580	187358	187035	186089	183299
6	Naogaon	460018	447427	422348	412612	414335	440165
7	Natore	134604	136406	140202	146172	144096	143956
8	Chapai Nawabgonj	150169	145472	148537	150847	136006	150431
9	Rangpur	301629	305621	321229	316557	315769	321887
10	Gaibandha	237131	239452	244006	251780	263519	263105
11	Kurigram	205084	209537	233857	231211	227107	233338
12	Nilphamari	189581	188789	213380	196295	186910	197245
13	Lalmonirhat	132520	130891	137398	133839	139059	134319
14	Dinajpur	438957	434921	439408	437333	457390	446803
15	Thakurgaon	199324	197223	218834	208199	216893	213299
16	Panchagar	131232	128195	133078	130357	119694	134131
Total		3693454	3653080	4233941	3723684	3721218	3796339

Source: Department of Agricultural Extension (2022)

Estimate of total rice (Aus+Aman+Boro) area from 2015-16 to 2020-21 has shown in the above table. The result revealed that in the year 2017-18 the total rice (Aus+Aman+Boro) cultivation area was 4233941 hectares which was maximum but in the year 2016-17 the total rice (Aus+Aman+Boro) cultivation area was 3653080 hectares which was minimum.

Table 20: Estimate of Boro Rice (HYV)

Sl. No.	Districts	2008-09			2009-10		
		Area (Hectares)	Production (M.Ton)	Yield (Ton/ha)	Area (Hectares)	Production (M.Ton)	Yield (Ton/ha)
1	Bogura	135502	517568	3.820	147875	568649	3.845
2	Joypurhat	42027	153163	3.644	43331	163029	3.762
3	Pabna	63001	255869	4.061	64835	254883	3.931
4	Sirajgonj	113168	445206	3.934	119764	445969	3.724
5	Rajshahi	68650	273235	3.980	62356	227421	3.647
6	Naogaon	165138	659709	3.995	168586	672397	3.988
7	Natore	56600	235771	4.166	53934	226456	4.199
8	Chapai Nawabgonj	49718	191325	3.848	48550	166905	3.438
9	Rangpur	80543	290336	3.605	88028	335344	3.81
10	Gaibandha	79135	298033	3.766	89784	351390	3.914
11	Kurigram	62117	244656	3.939	67751	265472	3.918
12	Nilphamari	53705	199783	3.720	55374	207371	3.745
13	Lalmonirhat	34001	130374	3.834	30878	122300	3.961
14	Dinajpur	136856	493707	3.607	134623	485527	3.607
15	Thakurgaon	56394	236938	4.201	52771	215000	4.074
16	Panchagar	26046	97828	3.756	32373	119830	3.702
Total		1222601	4723501	61.876	1260813	4827943	61.265

Source: Department of Agricultural Extension (2022)

Estimate of boro rice (HYV) area, production and yield from 2008-09 and 2009-10 has shown in the above table. The result revealed that in the year 2008-09 boro rice (HYV) cultivation area was 3697561 hectares, production was 4723501 M. Ton and yield was 61.876 Ton/ha. In the year 2009-10 the boro rice (HYV) cultivation area was 1260813 hectares, production was 4827943M. Ton and yield was 61.265 Ton/ha.

Table 21: Estimate of Boro Rice (HYV)

Sl. No.	Districts	2010-11			2011-12		
		Area (Hectares)	Production (M.Ton)	Yield (Ton/ha)	Area (Hectares)	Production (M.Ton)	Yield (Ton/ha)
1	Bogura	155589	554827	3.566	158727	566164	3.567
2	Joypurhat	49155	194554	3.958	50650	209911	4.144
3	Pabna	64636	273714	4.235	65973	275605	4.178
4	Sirajgonj	118354	506219	4.277	120799	510658	4.227
5	Rajshahi	67106	262696	3.915	70924	282943	3.989
6	Naogaon	169633	707552	4.171	173423	705284	4.067
7	Natore	48833	223548	4.578	50831	234712	4.617
8	Chapai Nawabgonj	50071	188712	3.769	52862	200548	3.794
9	Rangpur	91953	309835	3.369	94888	321213	3.385
10	Gaibandha	90170	327365	3.631	95174	336229	3.533
11	Kurigram	68142	260466	3.822	70638	258669	3.662
12	Nilphamari	56657	215261	3.799	57588	209872	3.644
13	Lalmonirhat	30169	119519	3.962	32534	122348	3.761
14	Dinajpur	148908	553118	3.714	151417	564531	3.728
15	Thakurgaon	55014	217493	3.953	56232	219403	3.902
16	Panchagar	39426	153358	3.890	40144	146782	3.656
Total		1303816	5068237	62.609	1342804	5164872	61.854

Source: Department of Agricultural Extension (2022)

Estimate of boro rice (HYV) area, production and yield from 2010-11 and 2011-12 has shown in the above table. The result revealed that in the year 2010-11 boro rice (HYV) cultivation area was 1303816hectares, production was 5068237M. Ton and yield was 62.609Ton/ha. In the year 2011-12 the boro rice (HYV) cultivation area was 1342804hectares, production was 5164872M. Ton and yield was 61.854 Ton/ha.

Table 22: Estimate of Boro Rice (HYV)

Sl. No.	Districts	2012-13			2013-14		
		Area (Hectares)	Production (M.Ton)	Yield (Ton/ha)	Area (Hectares)	Production (M.Ton)	Yield (Ton/ha)
1	Bogura	162460	631780	3.889	167000	654979	3.922
2	Joypurhat	50856	213719	4.202	52441	231601	4.416
3	Pabna	68561	290844	4.242	68324	287885	4.214
4	Sirajgonj	124012	514062	4.145	124180	500782	4.033
5	Rajshahi	70249	279472	3.978	68952	264453	3.835
6	Naogaon	177892	733139	4.121	177917	786250	4.419
7	Natore	48762	199794	4.097	49448	211769	4.283
8	Chapai Nawabgonj	50333	197547	3.925	50415	195589	3.880
9	Rangpur	94713	355743	3.756	95729	379690	3.966
10	Gaibandha	95364	375426	3.937	95731	368836	3.853
11	Kurigram	70221	283374	4.035	74596	302684	4.058
12	Nilphamari	57175	210319	3.679	57720	221959	3.845
13	Lalmonirhat	34236	125968	3.679	34612	133992	3.871
14	Dinajpur	155861	623080	3.998	159588	646814	4.053
15	Thakurgaon	57598	197106	3.422	56861	214671	3.775
16	Panchagar	37550	141384	3.765	38850	146565	3.773
Total		1355843	5372757	62.87	1372364	5548519	64.196

Source: Department of Agricultural Extension (2022)

Estimate of boro rice (HYV) area, production and yield from 2012-13 and 2013-14has shown in the above table. The result revealed that in the year 2012-13 boro rice (HYV) cultivation area was 1355843hectares, production was 5372757M. Ton and yield was 62.87Ton/ha. In the year 2013-14 the boro rice (HYV) cultivation area was 1372364hectares, production was 5548519M. Ton and yield was 64.196Ton/ha.

Table 23: Estimate of Boro Rice (HYV)

Sl. No.	Districts	2014-15			2015-16		
		Area (Hectares)	Production (M.Ton)	Yield (Ton/ha)	Area (Hectares)	Production (M.Ton)	Yield (Ton/ha)
1	Bogura	170998	589904	3.450	170176	613753	3.607
2	Joypurhat	50740	211547	4.169	49049	203139	4.142
3	Pabna	65900	263810	4.003	66064	262638	3.976
4	Sirajgonj	124779	523685	4.197	126824	531567	4.191
5	Rajshahi	65955	264032	4.003	64306	253872	3.948
6	Naogaon	187996	766458	4.077	188317	760819	4.040
7	Natore	50577	228127	4.510	51666	232562	4.501
8	Chapai Nawabgonj	48145	179410	3.726	47534	175380	3.690
9	Rangpur	97329	414764	4.261	95143	401939	4.225
10	Gaibandha	97831	350125	3.579	94451	332805	3.524
11	Kurigram	79832	318846	3.994	80345	324602	4.040
12	Nilphamari	55867	231378	4.142	56215	231781	4.123
13	Lalmonirhat	33904	128843	3.800	31945	117863	3.690
14	Dinajpur	158492	638860	4.031	159572	634384	3.976
15	Thakurgaon	54400	205730	3.782	55326	209742	3.791
16	Panchagar	34533	136012	3.939	34722	134516	3.874
Total		1377278	5451531	63.663	1371655	5421362	63.338

Source: Department of Agricultural Extension (2022)

Estimate of boro rice (HYV) area, production and yield from 2014-15 and 2015-16 has shown in the above table. The result revealed that in the year 2015-16 boro rice (HYV) cultivation area was 1377278 hectares, production was 5451531M. Ton and yield was 63.663Ton/ha. In the year 2015-16 the boro rice (HYV) cultivation area was 1371655hectares, production was 5421362M. Ton and yield was 63.338Ton/ha.

Table 24: Estimate of Boro Rice (HYV)

Sl. No.	Districts	2016-17			2017-18		
		Area (Hectares)	Production (M.Ton)	Yield (Ton/ha)	Area (Hectares)	Production (M.Ton)	Yield (Ton/ha)
1	Bogura	170454	644940	3.784	170607	649928	3.810
2	Joypurhat	49727	206130	4.145	49735	191944	3.859
3	Pabna	58309	231808	3.976	544446	217808	0.400
4	Sirajgonj	125971	513468	4.076	127520	536129	4.204
5	Rajshahi	61134	242756	3.971	64615	246033	3.808
6	Naogaon	178646	721416	4.038	189312	763444	4.033
7	Natore	51021	233988	4.586	58349	269913	4.626
8	Chapai Nawabgonj	45451	172559	3.797	46389	180058	3.881
9	Rangpur	90870	363855	4.004	91143	365872	4.014
10	Gaibandha	98140	351322	3.580	94407	350545	3.713
11	Kurigram	82626	318345	3.853	82190	325005	3.954
12	Nilphamari	54612	214995	3.937	68185	275726	4.044
13	Lalmonirhat	33823	131251	3.881	27977	99148	3.544
14	Dinajpur	160471	629667	3.924	158961	638111	4.014
15	Thakurgaon	50983	203764	3.997	58882	207258	3.520
16	Panchagar	31756	126834	3.994	30252	120854	3.995
Total		1343994	5307098	63.543	1862970	5437776	59.419

Source: Department of Agricultural Extension (2022)

Estimate of boro rice (HYV) area, production and yield from 2016-17 and 2017-18has shown in the above table. The result revealed that in the year 2016-17 boro rice (HYV) cultivation area was 1343994 hectares, production was 5307098 M. Ton and yield was 63.543 Ton/ha. In the year 2017-18 the boro rice (HYV) cultivation area was 1862970 hectares, production was 5437776 M. Ton and yield was 59.419 Ton/ha.

Table 25: Estimate of Boro Rice (HYV)

Sl. No	Districts	2018-19			2019-20			2020-21		
		Area (Hectares)	Production (M.Ton)	Yield (Ton/ha)	Area (Hectares)	Production (M.Ton)	Yield (Ton/ha)	Area (Hectares)	Production (M.Ton)	Yield (Ton/ha)
1	Bogura	168866	621646	3.681	167993	653759	3.89	167884	653557	3.893
2	Joypurhat	60621	243795	4.022	64036	240046	3.75	63619	256621	4.034
3	Pabna	52989	199223	3.760	49913	206211	4.13	52372	227472	4.343
4	Sirajgonj	128236	566703	4.419	128713	561211	4.360	125130	536453	4.287
5	Rajshahi	63433	249312	3.930	62000	235561	3.799	60645	243349	4.013
6	Naogaon	179308	773203	4.312	177204	771824	4.356	174930	768330	4.392
7	Natore	60585	271205	4.476	57644	249953	4.336	56483	241027	4.267
8	Chapai Nawabgonj	44942	162459	3.615	46112	192506	4.175	46933	208974	4.453
9	Rangpur	81532	314582	3.858	81658	319286	3.910	84015	326651	3.888
10	Gaibandha	92815	341166	3.676	95851	365057	3.809	92806	358442	3.862
11	Kurigram	79011	324823	4.111	72638	281681	3.878	71611	274052	3.827
12	Nilphamari	47455	186514	3.930	43079	167128	3.880	42739	166963	3.907
13	Lalmonirhat	26800	95556	3.566	22119	81856	3.701	21973	86846	3.952
14	Dinajpur	158103	624733	3.951	160302	651036	4.061	157601	643033	4.080
15	Thakurgaon	49603	183291	3.695	50038	182406	3.645	49650	182817	3.682
16	Panchagar	26404	107505	4.072	24196	100208	4.142	23065	84375	3.658
Total		1320703	5265716	63.074	1303496	5259729	63.822	1291456	5258962	64.538

Source: Department of Agricultural Extension (2022)

Estimate of boro rice (HYV) area, production and yield from 2018-19, 2019-20 and 2020-21 has shown in the above table. The result revealed that in the year 2018-19 boro rice (HYV) cultivation area was 1320703 hectares, production was 5265716 M. Ton and yield was 63.074 Ton/ha. In the year 2019-20 the boro rice (HYV) cultivation area was 130349 hectares, production was 5259729 M. Ton and yield was 63.822 Ton/ha. In the year 2020-21 the boro rice (HYV) cultivation area was 1291456 hectares, production was 5258962 M. Ton and yield was 64.538 Ton/ha.

Table 26: Estimate of Aus Rice (LV+HYV+HYB)

Sl. No.	Districts	2008-09			2009-10		
		Area (Hectares)	Production (M.Ton)	Yield (Ton/ha)	Area (Hectares)	Production (M.Ton)	Yield (Ton/ha)
1	Bogura	29102	60130	2.066	16549	27889	1.685
2	Joypurhat	51	95	1.863	28	32	1.143
3	Pabna	21879	24011	1.097	19829	18061	0.911
4	Sirajgonj	4413	6247	1.416	5276	7578	1.436
5	Rajshahi	49960	115356	2.309	31037	63960	2.061
6	Naogaon	34687	80586	2.323	30465	55776	1.831
7	Natore	10975	16321	1.487	8812	11795	1.339
8	Chapai Nawabgonj	49100	81055	1.651	42898	74854	1.745
9	Rangpur	0	0	0.000	0	0	0.000
10	Gaibandha	318	535	1.682	156	299	1.917
11	Kurigram	362	516	1.425	241	214	0.888
12	Nilphamari	0	0	0.000	0	0	0.000
13	Lalmonirhat	73	154	2.110	0	0	0.000
14	Dinajpur	9208	22245	2.416	3876	7826	2.019
15	Thakurgaon	0	0	0.000	0	0	0.000
16	Panchagar	0	0	0.000	0	0	0.000
Total		210128	407251	21.845	159167	268284	16.975

Source: Department of Agricultural Extension (2022)

Estimate of aus rice (LV+HYV+HYB) area, production and yield from 2008-09 and 2009-10 has shown in the above table. The result revealed that in the year 2008-09 aus rice (LV+HYV+HYB) cultivation area was 210128 hectares, production was 407251M. Ton and yield was 21.845Ton/ha. In the year 2009-10 the boro rice (LV+HYV+HYB) cultivation area was 159167 hectares, production was 268284 M. Ton and yield was 16.975 Ton/ha.

Table 27: Estimate of Aus Rice (LV+HYV+HYB)

Sl. No.	Districts	2010-11			2011-12		
		Area (Hectares)	Production (M.Ton)	Yield (Ton/ha)	Area (Hectares)	Production (M.Ton)	Yield (Ton/ha)
1	Bogura	22156	43404	1.959	25622	53248	2.078
2	Joypurhat	55	106	1.927	32	64	2.000
3	Pabna	21898	22009	1.005	22462	33050	1.471
4	Sirajgonj	4699	7691	1.637	5653	10389	1.838
5	Rajshahi	39468	85089	2.156	43585	106330	2.440
6	Naogaon	54785	136237	2.487	55650	117474	2.111
7	Natore	11088	16963	1.530	10563	21442	2.030
8	Chapai Nawabgonj	52688	101865	1.933	51870	99807	1.924
9	Rangpur	0	0	0.000	506	1004	1.984
10	Gaibandha	138	266	1.928	114	222	1.947
11	Kurigram	217	286	1.318	218	306	1.404
12	Nilphamari	0	0	0.000	0	0	0.000
13	Lalmonirhat	0	0	0.000	0	0	0.000
14	Dinajpur	4332	8603	1.986	5793	15678	2.706
15	Thakurgaon	83	227	2.735	1864	3968	2.129
16	Panchagar	0	0	0.000	4	5	1.250
Total		211607	422746	22.601	223936	462987	27.312

Source: Department of Agricultural Extension (2022)

Estimate of aus rice (LV+HYV+HYB) area, production and yield from 2010-11 and 2011-12 has shown in the above table. The result revealed that in the year 2010-11 aus rice (LV+HYV+HYB) cultivation area was 211607 hectares, production was 422746 M. Ton and yield was 22.601 Ton/ha. In the year 2011-12 the aus rice (LV+HYV+HYB) cultivation area was 223936 hectares, production was 462987 M. Ton and yield was 27.312 Ton/ha.

Table 28: Estimate of Aus Rice (LV+HYV+HYB)

Sl. No.	Districts	2012-13			2013-14		
		Area (Hectares)	Production (M.Ton)	Yield (Ton/ha)	Area (Hectares)	Production (M.Ton)	Yield (Ton/ha)
1	Bogura	23186	50923	2.196	23186	56120	2.420
2	Joypurhat	10	19	1.900	10	19	1.900
3	Pabna	21934	30776	1.403	23138	151892	6.565
4	Sirajgonj	5655	10078	1.782	6224	14875	2.390
5	Rajshahi	37824	95161	2.516	37260	95889	2.574
6	Naogaon	50686	130208	2.569	50335	142396	2.829
7	Natore	10182	18747	1.841	8542	17047	1.996
8	Chapai Nawabgonj	47355	102336	2.161	47446	103380	2.179
9	Rangpur	486	1068	2.198	0	0	0.000
10	Gaibandha	59	110	1.864	45	80	1.778
11	Kurigram	136	219	1.610	166	248	1.494
12	Nilphamari	0	0	0.000	0	0	0.000
13	Lalmonirhat	0	0	0.000	0	0	0.000
14	Dinajpur	4812	10333	2.147	3838	8411	2.192
15	Thakurgaon	1821	3916	2.150	1367	3353	2.453
16	Panchagar	3	4	1.333	1	1	1.000
Total		204149	453898	27.67	201558	593711	31.77

Source: Department of Agricultural Extension (2022)

Estimate of aus rice (LV+HYV+HYB) area, production and yield from 2012-13 and 2013-14 has shown in the above table. The result revealed that in the year 2013-14 aus rice (LV+HYV+HYB) cultivation area was 204149 hectares, production was 453898 M. Ton and yield was 27.67 Ton/ha. In the year 2013-14 the aus rice (LV+HYV+HYB) cultivation area was 201558 hectares, production was 593711 M. Ton and yield was 31.77 Ton/ha.

Table 29: Estimate of Aus Rice (LV+HYV+HYB)

Sl. No.	Districts	2014-15			2015-16		
		Area (Hectares)	Production (M.Ton)	Yield (Ton/ha)	Area (Hectares)	Production (M.Ton)	Yield (Ton/ha)
1	Bogura	22695	52125	2.297	21540	53446	2.481
2	Joypurhat	0	0	0.000	47	101	2.149
3	Pabna	20465	33782	1.651	14197	25904	1.825
4	Sirajgonj	6718	15405	2.293	5575	12242	2.196
5	Rajshahi	38887	111468	2.866	39853	112737	2.829
6	Naogaon	51638	144322	2.795	51469	138626	2.693
7	Natore	7728	16122	2.086	5083	10860	2.137
8	Chapai Nawabgonj	45083	108316	2.403	49115	115475	2.351
9	Rangpur	1325	3438	2.595	13430	37411	2.786
10	Gaibandha	325	600	1.846	1050	1763	1.679
11	Kurigram	832	1621	1.948	1671	3033	1.815
12	Nilphamari	0	0	0.000	373	551	1.477
13	Lalmonirhat	0	0	0.000	4720	11538	2.444
14	Dinajpur	4883	11216	2.297	6775	15748	2.324
15	Thakurgaon	3059	6884	2.250	10102	25466	2.521
16	Panchagar	0	0	0.000	190	413	2.174
Total		203638	505299	27.327	225190	565314	35.881

Source: Department of Agricultural Extension (2022)

Estimate of aus rice (LV+HYV+HYB) area, production and yield from 2014-15 and 2015-16 has shown in the above table. The result revealed that in the year 2014-15 aus rice (LV+HYV+HYB) cultivation area was 203638 hectares, production was 505299 M. Ton and yield was 27.327 Ton/ha. In the year 2015-16 the aus rice (LV+HYV+HYB) cultivation area was 225190 hectares, production was 565314 M. Ton and yield was 35.881 Ton/ha.

Table 30: Estimate of Aus Rice (LV+HYV+HYB)

Sl. No.	Districts	2016-17			2017-18		
		Area (Hectares)	Production (M.Ton)	Yield (Ton/ha)	Area (Hectares)	Production (M.Ton)	Yield (Ton/ha)
1	Bogura	18878	47137	2.497	19075	53795	2.820
2	Joypurhat	58	134	2.310	251	710	2.829
3	Pabna	14168	25867	1.826	16974	37653	2.218
4	Sirajgonj	4044	8820	2.181	4725	8955	1.895
5	Rajshahi	38824	103737	2.672	47069	134527	2.858
6	Naogaon	51546	139738	2.711	59190	177988	3.007
7	Natore	4959	10885	2.195	6855	18512	2.701
8	Chapai Nawabgonj	46922	112269	2.393	52630	135671	2.578
9	Rangpur	13695	35938	2.624	16075	48194	2.998
10	Gaibandha	1050	1849	1.761	1608	4191	2.606
11	Kurigram	1398	2966	2.122	1460	3209	2.198
12	Nilphamari	117	183	1.564	406	1154	2.842
13	Lalmonirhat	1259	2995	2.379	5037	15033	2.985
14	Dinajpur	5208	11577	2.223	7708	22157	2.875
15	Thakurgaon	9505	24014	2.526	14820	43345	2.925
16	Panchagar	121	297	2.455	280	644	2.300
Total		211752	528406	36.439	254163	705738	42.635

Source: Department of Agricultural Extension (2022)

Estimate of aus rice (LV+HYV+HYB) area, production and yield from 2015-16 and 2017-18 has shown in the above table. The result revealed that in the year 2016-17 aus rice (LV+HYV+HYB) cultivation area was 211752 hectares, production was 528406 M. Ton and yield was 36.439 Ton/ha. In the year 2017-18 the aus rice (LV+HYV+HYB) cultivation area was 254163 hectares, production was 705738 M. Ton and yield was 42.635 Ton/ha.

Table 31: Estimate of Aus Rice (LV+HYV+HYB)

Sl. No.	Districts	2018-19			2019-20		
		Area (Hectares)	Production (M.Ton)	Yield (Ton/ha)	Area (Hectares)	Production (M.Ton)	Yield (Ton/ha)
1	Bogura	20232	57385	2.836	26986	68154	2.526
2	Joypurhat	171	471	2.754	187	481	2.572
3	Pabna	15614	33819	2.166	18812	37134	1.974
4	Sirajgonj	5952	12552	2.109	8412	20574	2.446
5	Rajshahi	46579	131950	2.833	46994	134357	2.859
6	Naogaon	61614	179648	2.916	61761	178708	2.894
7	Natore	7408	18043	2.436	8345	22475	2.693
8	Chapai Nawabgonj	52015	138417	2.661	38410	102366	2.665
9	Rangpur	16314	47115	2.888	18794	50325	2.678
10	Gaibandha	2407	6157	2.558	7467	16888	2.262
11	Kurigram	1626	3692	2.271	3607	8347	2.314
12	Nilphamari	409	1116	2.729	1190	2768	2.326
13	Lalmonirhat	4852	14134	2.913	11025	27966	2.537
14	Dinajpur	6914	20324	2.940	6889	16801	2.439
15	Thakurgaon	15111	44214	2.926	14674	43488	2.964
16	Panchagar	377	1049	2.782	1995	5236	2.625
Total		257595	710086	42.718	275548	736068	40.774

Source: Department of Agricultural Extension (2022)

Estimate of aus rice (LV+HYV+HYB) area, production and yield from 2018-19 and 2019-20 has shown in the above table. The result revealed that in the year 2018-19 aus rice (LV+HYV+HYB) cultivation area was 257595 hectares, production was 710086 M. Ton and yield was 42.718 Ton/ha. In the year 2019-20 the aus rice (LV+HYV+HYB) cultivation area was 275548 hectares, production was 736068 M. Ton and yield was 40.774 Ton/ha.

Table 32: Estimate of Rice (Aus+Aman+Boro)

Sl. No.	Districts	2008-09			2009-10		
		Area (Hectares)	Production (M.Ton)	Yield (Ton/ha)	Area (Hectares)	Production (M.Ton)	Yield (Ton/ha)
1	Bogura	395561	1229298	3.108	382919	1141961	2.982
2	Joypurhat	137603	438004	3.183	138539	449879	3.247
3	Pabna	178620	476667	2.669	184722	466073	2.523
4	Sirajgonj	207365	676148	3.261	216617	675328	3.118
5	Rajshahi	198327	620739	3.130	177995	530432	2.980
6	Naogaon	405959	1319994	3.252	408863	1323960	3.238
7	Natore	149304	463811	3.106	146415	460827	3.147
8	Chapai Nawabgonj	149886	414011	2.762	141070	369169	2.617
9	Rangpur	263987	804610	3.048	272176	861538	3.165
10	Gaibandha	219860	687494	3.127	232034	698696	3.011
11	Kurigram	187164	548963	2.933	193443	571657	2.955
12	Nilphamari	183766	574621	3.127	182925	546681	2.989
13	Lalmonirhat	132057	389883	2.952	130376	397153	3.046
14	Dinajpur	430106	1295692	3.012	425864	1254316	2.945
15	Thakurgaon	172670	535672	3.102	181412	627464	3.459
16	Panchagar	133985	375939	2.806	127491	352138	2.762
Total		3546220	10851546	48.578	3542861	10727272	48.184

Source: Department of Agricultural Extension (2022)

Estimate of rice (Aus+Aman+Boro) area, production and yield in the years 2008-09 and 2009-10 has shown in the above table. The result revealed that in the year 2008-09 rice (Aus+Aman+Boro) cultivation area was 3546220 hectares, production was 10851546 M. Ton and yield was 48.578 Ton/ha. In the year 2009-10 the rice (Aus+Aman+Boro) cultivation area was 3542861 hectares, production was 10727272M. Ton and yield was 48.184 Ton/ha.

Table 33: Estimate of Rice (Aus+Aman+Boro)

Sl. No.	Districts	2010-11			2011-12		
		Area (Hectares)	Production (M.Ton)	Yield (Ton/ha)	Area (Hectares)	Production (M.Ton)	Yield (Ton/ha)
1	Bogura	392263	1136592	2.898	394370	1174070	2.977
2	Joypurhat	137928	466631	3.383	137646	469904	3.414
3	Pabna	185957	496087	2.668	176985	500150	2.826
4	Sirajgonj	217996	749235	3.437	220754	758967	3.438
5	Rajshahi	186013	573729	3.084	192950	603251	3.126
6	Naogaon	439617	1444610	3.286	444814	1430824	3.217
7	Natore	141843	447492	3.155	148067	488040	3.296
8	Chapai Nawabgonj	146203	404690	2.768	151166	416984	2.758
9	Rangpur	267058	848402	3.177	278078	887069	3.190
10	Gaibandha	232629	708653	3.046	234834	736052	3.134
11	Kurigram	200052	620819	3.103	202744	626383	3.090
12	Nilphamari	187184	579594	3.096	185650	596041	3.211
13	Lalmonirhat	126008	415853	3.300	128606	410326	3.191
14	Dinajpur	425227	1313989	3.090	427006	1282828	3.004
15	Thakurgaon	183435	636598	3.470	184624	567077	3.072
16	Panchagar	127703	382855	2.998	133003	393465	2.958
Total		3597116	11225829	49.959	3641297	11341431	49.902

Source: Department of Agricultural Extension (2022)

Estimate of rice (Aus+Aman+Boro) area, production and yield in the years 2010-11 and 2011-12 has shown in the above table. The result revealed that in the year 2010-11 rice (Aus+Aman+Boro) cultivation area was

3597116 hectares, production was 11225829 M. Ton and yield was 49.959 Ton/ha. In the year 2011-12 the rice (Aus+Aman+Boro) cultivation area was 3641297 hectares, production was 11341431 M. Ton and yield was 49.902 Ton/ha.

Table 34: Estimate of Rice (Aus+Aman+Boro)

Sl. No.	Districts	2012-13			2013-14		
		Area (Hectares)	Production (M.Ton)	Yield (Ton/ha)	Area (Hectares)	Production (M.Ton)	Yield (Ton/ha)
1	Bogura	389272	1229555	3.159	394301	1281099	3.249
2	Joypurhat	138505	490783	3.543	136445	500091	3.665
3	Pabna	179310	514054	2.867	172453	613340	3.557
4	Sirajgonj	220381	744180	3.377	221442	756497	3.416
5	Rajshahi	181773	594892	3.273	178145	572134	3.212
6	Naogaon	448240	1513027	3.375	447138	1585158	3.545
7	Natore	139713	421781	3.019	138683	430111	3.101
8	Chapai Nawabgonj	144102	420455	2.918	145661	418667	2.874
9	Rangpur	288814	947625	3.281	289627	998812	3.449
10	Gaibandha	233502	772386	3.308	240080	790951	3.295
11	Kurigram	198370	636212	3.207	205543	651062	3.168
12	Nilphamari	190372	625839	3.287	188163	608393	3.233
13	Lalmonirhat	131107	416321	3.175	131060	423453	3.231
14	Dinajpur	422948	1338733	3.165	425572	1378409	3.239
15	Thakurgaon	181834	514706	2.831	184065	571070	3.103
16	Panchagar	137241	403673	2.941	134040	399614	2.981
Total		3625484	11584222	50.726	3632418	11978861	52.318

Source: Department of Agricultural Extension (2022)

Estimate of rice (Aus+Aman+Boro) area, production and yield in the years 2012-13 and 2013-14 has shown in the above table. The result revealed that in the year 2012-13 rice (Aus+Aman+Boro) cultivation area was 3625484 hectares, production was 11584222 M. Ton and yield was 50.726 Ton/ha. In the year 2011-12 the rice (Aus+Aman+Boro) cultivation area was 3632418 hectares, production was 11978861 M. Ton and yield was 52.318 Ton/ha.

Table 35: Estimate of Rice (Aus+Aman+Boro)

Sl. No.	Districts	2014-15			2015-16		
		Area (Hectares)	Production (M.Ton)	Yield (Ton/ha)	Area (Hectares)	Production (M.Ton)	Yield (Ton/ha)
1	Bogura	394130	1221045	3.098	389040	1236451	3.178
2	Joypurhat	136457	471131	3.453	138033	490671	3.555
3	Pabna	179254	501489	2.798	174936	493105	2.819
4	Sirajgonj	234334	816737	3.485	229443	803882	3.504
5	Rajshahi	180270	609983	3.384	181753	606450	3.337
6	Naogaon	467889	1593963	3.407	460018	1552191	3.374
7	Natore	135926	443618	3.264	134604	439619	3.266
8	Chapai Nawabgonj	146414	428004	2.923	150169	433519	2.887
9	Rangpur	293891	1044245	3.553	301629	1054638	3.496
10	Gaibandha	250393	803296	3.208	237131	764356	3.223
11	Kurigram	205586	662711	3.224	205084	666657	3.251
12	Nilphamari	188868	662226	3.506	189581	650230	3.430
13	Lalmonirhat	128428	416249	3.241	132520	420261	3.171
14	Dinajpur	433504	1360948	3.139	438957	1378791	3.141
15	Thakurgaon	188523	597003	3.167	199324	627372	3.147
16	Panchagar	133694	418838	3.133	131232	411104	3.133
Total		3697561	12051486	51.983	3693454	12029297	51.912

Source: Department of Agricultural Extension (2022)

Estimate of rice (Aus+Aman+Boro) area, production and yield in the years 2014-15 and 2015-16 has shown in the above table. The result revealed that in the year 2014-15 rice (Aus+Aman+Boro) cultivation area was 3697561 hectares, production was 12051486 M. Ton and yield was 51.983 Ton/ha. In the year 2015-16 the rice (Aus+Aman+Boro) cultivation area was 3693454 hectares, production was 12029297 M. Ton and yield was 51.912 Ton/ha.

Table 36: Estimate of Rice (Aus+Aman+Boro)

Sl. No.	Districts	2016-17			2017-18		
		Area (Hectares)	Production (M.Ton)	Yield (Ton/ha)	Area (Hectares)	Production (M.Ton)	Yield (Ton/ha)
1	Bogura	385768	1E+06	3.270	370468	1232886	3.328
2	Joypurhat	138758	495876	3.574	138956	475870	3.425
3	Pabna	166263	463675	2.789	658018	466906	0.710
4	Sirajgonj	221777	772255	3.482	226864	793742	3.499
5	Rajshahi	176580	583485	3.304	187358	600255	3.204
6	Naogaon	447427	2E+06	3.399	422348	1422096	3.367
7	Natore	136406	453223	3.323	140202	476556	3.399
8	Chapai Nawabgonj	145472	433262	2.978	148537	452626	3.047
9	Rangpur	305621	1E+06	3.435	321229	1126709	3.507
10	Gaibandha	239452	774685	3.235	244006	808221	3.312
11	Kurigram	209537	678411	3.238	233857	792063	3.387
12	Nilphamari	188789	640208	3.391	213380	730039	3.421
13	Lalmonirhat	130891	430991	3.293	137398	430323	3.132
14	Dinajpur	434921	1E+06	3.134	439408	1452196	3.305
15	Thakurgaon	197223	639685	3.243	218834	679998	3.107
16	Panchagar	128195	405160	3.160	133078	415274	3.121
Total		3653080	11770916	52.248	4233941	12355760	50.271

Source: Department of Agricultural Extension (2022)

Estimate of rice (Aus+Aman+Boro) area, production and yield in the years 2016-17 and 2017-18 has shown in the above table. The result revealed that in the year 2016-17 rice (Aus+Aman+Boro) cultivation area was 3653080 hectares, production was 11770916 M. Ton and yield was 52.248Ton/ha. In the year 2017-18 the rice (Aus+Aman+Boro) cultivation area was 4233941 hectares, production was 12355760 M. Ton and yield was 50.271 Ton/ha.

Table 37: Estimate of Rice (Aus+Aman+Boro)

Sl. No.	Districts	2018-19			2019-20		
		Area (Hectares)	Production (M.Ton)	Yield (Ton/ha)	Area (Hectares)	Production (M.Ton)	Yield (Ton/ha)
1	Bogura	381723	1234994	3.235	394303	1E+06	3.241
2	Joypurhat	147044	508679	3.459	147062	486595	3.309
3	Pabna	159237	433180	2.720	140027	427926	3.056
4	Sirajgonj	233443	834171	3.573	232959	845801	3.631
5	Rajshahi	187035	600454	3.210	186089	592016	3.181
6	Naogaon	412612	1439413	3.489	414335	1E+06	3.545
7	Natore	146172	484974	3.318	144096	467271	3.243
8	Chapai Nawabgonj	150847	446275	2.958	136006	430001	3.162
9	Rangpur	316557	1141918	3.607	315769	1E+06	3.618
10	Gaibandha	251780	835228	3.317	263519	871813	3.308
11	Kurigram	231211	796068	3.443	227107	773842	3.407
12	Nilphamari	196295	695872	3.545	186910	628258	3.361
13	Lalmonirhat	133839	431369	3.223	139059	448204	3.223
14	Dinajpur	437333	1472046	3.366	457390	2E+06	3.315
15	Thakurgaon	208199	658546	3.163	216893	661852	3.052
16	Panchagar	130357	426863	3.275	119694	393810	3.290
Total		3723684	12440050	52.901	3721218	12027389	52.942

Source: Department of Agricultural Extension (2022)

Estimate of rice (Aus+Aman+Boro) area, production and yield in the years 2018-19 and 2019-20 has shown in the above table. The result revealed that in the year 2018-19 rice (Aus+Aman+Boro) cultivation area was 3723684 hectares, production was 12440050 M. Ton and yield was 52.901 Ton/ha. In the year 2019-20 the rice (Aus+Aman+Boro) cultivation area was 3721218 hectares, production was 12027389 M. Ton and yield was 52.942 Ton/ha.

Table 38: Estimate of Rice (Aus+Aman+Boro)

Sl. No.	Districts	2020-21		
		Area (Hectares)	Production (M.Ton)	Yield (Ton/ha)
1	Bogura	395976	1326254	3.349
2	Joypurhat	138135	474277	3.433
3	Pabna	168258	468804	2.786
4	Sirajgonj	231992	771333	3.325
5	Rajshahi	183299	623293	3.400
6	Naogaon	440165	1496570	3.400
7	Natore	143956	490503	3.407
8	Chapai Nawabgonj	150431	495130	3.291
9	Rangpur	321887	1100055	3.418
10	Gaibandha	263105	884717	3.363
11	Kurigram	233338	771006	3.304
12	Nilphamari	197245	672570	3.410
13	Lalmonirhat	134319	437162	3.255
14	Dinajpur	446803	1441426	3.226
15	Thakurgaon	213299	643076	3.015
16	Panchagar	134131	434283	3.238
Total		3796339	12530459	52.62

Source: Department of Agricultural Extension (2022)

Estimate of rice (Aus+Aman+Boro) area, production and yield in the year 2020-21 has shown in the above table. The result revealed that in the year 2020-21rice (Aus+Aman+Boro) cultivation area was 3796339 hectares, production was 12530459 M. Ton and yield was 52.62 Ton/ha.

CONCLUSION AND RECOMMENDATION

The majority of the 170 million people that live in Bangladesh consume rice. It provides over two-thirds of the nation's total calorie supply, over 48% of the employment for rural workers, and around half of the average person's protein consumption (DAE, 2019). In Bangladesh, rice accounts for one-sixth of the country's income and more than half of the agricultural GDP. In the country, rice is grown by almost all of the 13 million agricultural families. The area dedicated to rice growing is approximately 10.5 million hectares, and this quantity has been almost constant over the past three decades. Over 80% of irrigated land and about 75% of arable land are planted with rice. The Bangladeshi people's livelihood depends so heavily on rice. When Bangladesh had a population of roughly 70.88 million people in 1971, the country produced 10.59 million tons of rice. This shows that rice production increased far more quickly than the population. The adoption of new rice varieties on roughly 66% of rice acreage, which accounts for about 73% of the nation's total rice production, is largely to blame for this increase in rice output. But there's no reason to get complacent. In the next twenty years, Bangladesh's population is expected to double at a rate of two million people every year. However, the crop on less than 40,198 hectares of land in many northern districts was completely destroyed in FY 2015–16 due to flash flooding, drought, and other natural calamities. The study's findings might also be applicable in Bangladesh's other regions with comparable socioeconomic, cultural, and environmental traits. As a result, the findings may be useful to planners, policymakers, extension personnel, and field personnel for effective planning to increase rice production. The mentioned 16 districts are contributing the total cultivation and production in national cultivation and production of rice in Bangladesh. From the result it was found that in the fiscal year 2009–10, total cultivation of aus, aman and boro rice was 3542861 hectares and total production of aus, aman and boro rice was 10727272 metric tons. Bangladesh commenced exporting aromatic rice, with shipments amounting to 663 tonnes. In fiscal year 2014-15, total cultivation of aus, aman and boro rice was 3697561 hectares and total production of aus, aman and boro rice was 12051486 metric tons. In 2014, Bangladesh initiated the export of 50,000 tons of non-fragrant coarse rice to Sri Lanka for the first time under a government-to-government deal, priced at \$450 per ton, driven by strong output and ample government stocks. In fiscal year 2019–20, total cultivation of aus, aman and boro rice was 3721218 hectares and total production of of aus, aman and boro rice was 12027389 metric tons. Over subsequent years, the volume of exports increased significantly, reaching 10,879 tons in fiscal year 2019–20. Production cost of rice is more in comparison to other crops. So government should take necessary steps so that the prices of inputs (fertilizers, seeds, irrigation, pesticides) of rice production stay very cheap. For this reason government should provide more subsidies in fertilizers, seeds and pesticides. There are shortages of good quality rice seeds. Local rice varieties seeds are available but quality is a problem of local seeds and per hectare production is less than high yielding varieties and hybrid varieties. Per hectare production of hybrid rice seeds is more but very much scarcity of hybrid rice seeds in Bangladesh. The prices of hybrid seeds are more than local rice varieties and high yielding varieties. Hybrid rice varieties are imported from other countries of the world for this reason each and every year Bangladesh spent a lot of foreign currencies. So government should give emphasis to produce high yielding varieties rice. More research and development should be done so that more hybrid rice varieties can be developed in Bangladesh which will save foreign currencies. Government should take more steps so that farmers can get mechanical support to cultivate land, transplant seedlings, harvest rice, thrash and thresh paddy. There are some areas of the study area where flood damages many rice fields so more research should be done to develop flood tolerant rice varieties. Drought also damages many rice fields so more research should be done to develop drought tolerant rice varieties.

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