



ROLE OF AGRO BASED INDUSTRIES IN THE ECONOMIC DEVELOPMENT OF GHAZIABAD

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ABSTRACT

Agriculture and agro-based industries are the tonic pillar of economic structure and socio economic development in Ghaziabad district and agro-based industries are destined to play a pivotal role in the 2nd process of development. With growing unemployment the planning of balanced agro-industrial development seems to be the only way out to improve socio-economic development. Keeping this view in mind the present study entitled, Agro-Industries and their impact on the Socio-economic Development in District Ghaziabad (U.P) has been undertaken as a model. It is also in mind to analyze and explain the actual relationship of agro-industries and socio-economic development. Ghaziabad district is well endowed with agricultural raw materials and agro- industries such as Sugar Industry, Rice Mill, Flour Mill, Textile, Oil Industries etc. Agricultural products such as sugar cane, wheat, rice, oil seeds, cotton, fiber crops etc live stock wealth and horticultural products provide directly and indirectly abundant raw materials to agro-based industries and measurement of potential supply of agricultural raw materials. The growth and distributional pattern of major agro-based industries, minor agro-based cottage industries, live stock based and horticultural industries are very important and play central determinant factor and pivotal role in the socio-economic development of the area.

INTRODUCTION

The district Ghaziabad is a part of Northern side Upper Ganga Plain. The district Ghaziabad was the tehsil Head Quarter of the district Meerut before 14th November 1976. It was draped out from the area of the old undivided district Meerut and Bulandshahr. 14th November 1976 was a golden day in the history of the local pleasantry, when Hon. Shri N.D. Tiwari, the then Chief Minister of U.P, gave a gift declaring Ghaziabad as a district on behalf of the Govt. of Uttar Pradesh. Again another district namely Panchheel Nagar was declared consisting of 2 tehsils i.e. Hapur and Garhmukteshwar and creating a new one i.e. Dhaulana by Km. Mayawati, the then Chief Minister of U.P. Now, the name of the district Panchheel Nagar has been changed as old name i.e Hapur by Shri. Akhilesh Yadav, present Chief Minister of U.P. India stands second (after China) in population (16per cent) and seventh in Area (2 per cent) of the world. Credit goes to India agriculture which includes the cultivation of variety of crops and creditable production, The production of crops provides abundant supply of agricultural raw materials to be consumed by agro-based industries as their raw materials as well as invites attention of investors to establish agro-based industries. As agricultural and agro- based industries are closely related with each other in an agriculturally predominant country like India. Agriculture and agro-based industries are the tonic pillar of economic structure and socio economic

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development in Ghaziabad district and agro-based industries are destined to play a pivotal role in the 2nd process of development. With growing unemployment the planning of balanced agro-industrial development seems to be the only way out to improve socio-economic development. Keeping this view in mind the present study entitled, Agro-Industries and their impact on the Socio-economic Development in District Ghaziabad (U.P) has been undertaken as a model. It is also in mind to analyze and explain the actual relationship of agro-industries and socio-economic development. Ghaziabad district is well endowed with agricultural raw materials and agro- industries such as Sugar Industry, Rice Mill, Flour Mill, Textile, Oil Industries etc. Agricultural products such as sugar cane, wheat, rice, oil seeds, cotton, fiber crops etc live stock wealth and horticultural products provide directly and indirectly abundant raw materials to agro-based industries and measurement of potential supply of agricultural raw materials. The growth and distributional pattern of major agro-based industries, minor agro-based cottage industries, live stock based and horticultural industries are very important and play central determinant factor and pivotal role in the socio-economic development of the area.

A pure scientific study of agro-industrial Geography of Ghaziabad would be beneficial to the peasantry of the area in particular as well as to U.P. and our country in general, now when India is making sincere efforts for economic development through five year plans and other measures like green revolution, white revolution, blue revolution etc. If the agricultural and agro-based industries, the twin pillar of economy are well inter related and agro-industries are developed in suitable area like Ghaziabad district of U.P., a sound economic base will develop since agricultural products directly or indirectly provide raw materials and employment to all public and private sector-agro-based industries. The present study will be a model study to Geographers, Social Scientist, Economists, Agricultural Scientists, Industrialist and Planners as well as for those who involve themselves to invest in agriculture and agro-based industries. It will be a pure scientific study which will reveal the closest relationship between the growth of agro-based industries of the area and their impact on the socio-economic development of the people. This will be carried out on Tehsil, Block, as well as on sample village levels.

Location of Area

The district Ghaziabad lies in the doab of famous rivers of northern India, the Ganga and the Yamuna in the western part of the state of Uttar Pradesh. The district is a level plain having low lands known as Khadar in the east of the Yamuna and the west of the Ganga Rivers, the area lying in between rivers Ganga and Kali Nadi, Doab area of the Kali Nadi and Hindan River and area lying in between Hindan and Yamuna rivers. The district has four tehsil namely Modinagar, Garhmukteshwar, Ghaziabad and Hapur. For development purposes, the district is divided into eight community development blocks. They are located at Bhojpur, Muradnagar, Razapur, Loni, Dhaulana, Hapur, Simbhaoli and Garhmukteshwar. Community Development Blocks are further divided into 409 Gram Sabhas. "The district has 560 villages, out of which 522 villages are inhabited and 38 uninhabited. There are 17 towns in the district."

Extent of Area

District Ghaziabad is situated in the western part of the state. It is situated between the parallels of latitude 28°25' to 28°55' north and longitude 77°12' and 78°15' east. It is bounded on the east by district Jyotiba Phule Nagar and on the west by the state of Delhi and are separated by the rivers of Ganga and Yamuna in the east and west respectively. In the north, the district Meerut and the southern boundary extends to the district Bulandshahr and Gautam Buddha Nagar (New District carved out from Ghaziabad and Bulandshahr). The length of the district from east to west is nearly 88 km and maximum breadth from north to south is nearly 51km. The geographical area of the district is 1148 sq.km. The total area of Ghaziabad district has been worked out as 2594 sq. Km. The total population of district was 33,14,070 persons having 2866 persons/km² density and sex ratio 860 female / 1000 male. Total literacy rate was found 1899735 persons. At the census of 2001, the percentage among males and females is 79.8 and 58.0 respectively. The percentage of literacy of the total population of the district 69.7.

Abiotic Profile of Area

"Abiotic profile explains the science of development and evolution at the landforms lies between geography and geology. Hence it seeks to discover the temporal relations of all that has happened to and on that crust".

(A). **Physical Features** : Physical features mean "a description of nature, or of natural features in their casual relationship.". The aspect of geography which is concerned with the shape, and form of

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land- surface, the configuration, extent and nature of seas and oceans, atmosphere and layers of soil, and natural vegetation called physical features.

(a) Relief Features: The district is formed by alluvium of rivers Ganga & Yamuna. The district is almost alluvial plain with slight slope from North to South-East and somewhat from West to East. It is evident from the flow of rivers. The average gradient/slope is about two feet in a mile or 35cm/km. and is almost uniform throughout the district. Ghaziabad district is situated in the southern part of upper Ganga plain, before partition it was a part of Indo-Gangtic plain, now a day it is known as Sutej-Ganga plain. Being formed by the deposition work of rivers, it is very smooth and even. It has a very gentle slope from North to South. The width of plain is not uniform. Flood is a frequent process. With the result several sand dunes are found in the river vallies by the erosional works of rivers. The pressure of population in the area as well as encroachment has affected the relief features. With the result flood water of Hindan and Yamuna rivers came close to each other. The district may be divided into four physical divisions.

1. Khaddar/New Alluvial Plain
2. Bangar/Old Alluvial Plain
3. Uplands
4. Bhur

Khaddar/New Alluvial Plain

(i) Ganga Khaddar: Ganga Khaddar lies on the right bank of River Ganga. It extends from 25 Km. to North South. It's average width is 30 Km. Every year during monsoon the whole area remains affected by flood water. The flood havoc is more frequent in Ganga Khaddar than that of Yamuna Khaddar. It has fine clay. Soil is fertile and beneficial for paddy/ Rice cultivation.

(ii) Hindan Khaddar: Hindan River, a tributary of Yamuna River, originates from Saharanpur District, from upper Shivalik Range in lower Himalaya. The river is entirely rainfed and has a catchment area of 7,083 sq. km. It flows between Ganga and Yamuna rivers in the district.

(iii) Yamuna Khadar: "Yamuna River is one of the most beautiful river in India. It is the biggest tributary of the Ganga (also known as Ganga) in Northern India. The famous river has its source of origin from the Yamunotri Glacier at an elevation of 6387 meters on South-Western sides of Bandar Pooch crests in the lower Himalayan Ranges. The river runs on over all span of 1376km (855 miles) and has a catchment area of 366,223km²

Bangar/Old Alluvial Plain

The areas which are not affected by the flood waters are called Banger area or old Alluvial plain. It is the old formation of rivers or flood. It contains day as well as sandy soils. Bangers are also fertile and predominantly cultivated and have thick population and heavy density. The Bangar plain may be studied under following heads:-

(i) Ganga Kali Doab: it lies in between Rivers Ganga and Kali, in the eastern part of District. This Doab covers a little area of eastern part of Hapur block, entire Simbhaoli and Garhmukteshwar Blocks. It has a fertile alluvial soil. It is an agricultural area. Mostly wheat, sugar, cane, potatoes, peas and other edibles, fruits and vegetables are cultivated. Being establishment of The Simbhaoli Sugars Ltd. sugar cane is dominant and cash crop.

(ii) Kali Hindan Doab: This doab lies in between Kali and Hindan Rivers. It is an upland and unaffected by flood waters, Soil are rich but affected by sand and clay. Area is predominantly agricultural and produces wheat, Peas, sugarcane, Potatoes, fodders and other edible and vegetables. It is thickly populated. This tract, is high throughout the area, also known as the central tract and is naturally of a fertile character. Here the water level is very low.

(iii) Yamuna - Hindan Doab: This tract lies between the Yamuna on the west and the Hindan on the east and includes Loni block of Ghaziabad tehsil. The width of area in the north comparatively much more (about 25km. south) than south. It narrow towards south where these two rivers tend to converge. The tract, in general, is the most fertile Portion of the district, consisting of rich and almost uniformly loamy soil. Then northern portion contains rich alluvial soil with excellent fertility but the southern parts made up of inferior land, mostly adjacent to the Yamuna.

Uplands: "This tract comprises the area between the central depression and the ravines of the Ganga and includes the major portion of the tehsil Hapur. The soil generally resembles that of the bhur ridge adjoining the Ganga khader. The entire eastern portion is broken up by Ganga. Very poor fertility is found due to the presence of sand. It is drained by the Kali Nadi (East) and its affluents, one of its important features being the existence of a series of sandy bhur strips, sometimes occurring in the form of bluffs which are generally confined to the vicinity of this river and the Ganga. One of these

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ridges runs diagonally south-east from the point where the Hindan enters the district, Ghaziabad and extends to the southern border where it enters the district of Bulandshahr.”

Bhur: “These bhur strips owe their origin to an admixture of sand in the stratum and to the action of wind but there are stretches of good soil in between which here and there are fairly extensive. Though the soil is not as rich as in the Yamuna-Hindan doab. The entire eastern portion is broken up by the Ganga in the west. Further south to the east of Hapur, there is also sand and the town’s west flank is scored by the Kali Nadi (East) and its tributaries.”

Geology: About the deposition of alluvium Prof. R.L. Singh has rightly remarked-“Alluvium is one continuous and conformable series of fluvial and sub aerial deposits, mainly composed of unconsolidated beds of clay, and gravel and their mixture in varying portion.” Formally this region was a part of Tethys Sea which was filled up by deposition of rivers flowing from Angara land in the north and Gondwana land in the south. With the result the alluvium deposits are very deep. “The famous scientist **Mrs. Oldham** has estimated the alluvial deposits about 4,000-6,000 meters. **Sidney Burrard** has estimated the region as a depression having at least 32 km depth. After word **Mr. Glennie** observed the depth of alluvium about 2,000 meters. At present the most reliable source of today i.e. **Aero Magnetic Survey** threw light about the depth of alluvium deposits in Ganga plain on an average 1300- 1400 metres.” The alluvial deposits of the Ganga and those of its tributaries cover the whole of the district. The minerals found in the district are reh (which is essentially a mixture of sodium sulfate with traces of calcium and magnesium salt) and kankar. “Prior to 1833 salt was obtained from the extensive salt tracts of Tehsil Ghaziabad particularly from the low lying Khadar lands of Yamuna in Pargana Loni which probably drives its name accordingly”

(a) Reh: “This minerals found in Ghaziabad district. The layer attains a thickness of 7.5 to 10 cm. in Tehsil Ghaziabad reh occurs intensively between the villages of Saddiqnagar and Dharaolikhurel which are located in Pargana Loni on the left bank of Yamuna, the incrustation being almost continuous and about 7.5cm thick, the average thickness being about 2.5cm. The northern reh tract of Loni group has an area of 9,71,098 square meters nearly half of which is covered with visible glistening white reh. The average quantity obtained in a year being estimated at 5296 tones. This mineral is also found in a small area in the south western part of Pargana Loni, the amount available being estimated at 2,195 metric tones. About 60.694 square meters in the Loni tract are also covered with reh. The amount available being estimated to be 329.2 tones per year.”

(b) Kankar: “Kankar occurs in various parts of the district in block as well as Nodular form. It is used for construction of metalled Road and Canals. The well known block of kankar pits are those of Nandpur and Narainpur in Tehsil Ghaziabad. Nodular kankar is found in all parts of district especially in the neighborhood of the towns of Hapur and Ghaziabad”.

(c) Climate: This district comes under monsoon climate, means totally influenced by south west monsoon. During monsoon months the air of oceanic origin reaches the district, bringing with it increased humidity, cloudiness and rain. Climate may be divided in to four seasons. The **Cold season** from the end of November to be beginning of the march, is followed by the **Hot season** which continues till about the end of June, when the South-West monsoon arrives, the **Monsoon season** lasting till September and the next month forming the **Transitional period**. The climate of the district is almost similar to the surrounding districts. In the summer, the climate is quite warm and likewise the winter is also quite cold. The rains are heavy and widespread. The monsoon start in the district in the last week of June and continues till the end of September. Winter season in the district spans from October of February, summer from March to June and the rainy season between July and September. “Average maximum temperature of the district is 43.7oC and minimum being 4.4oC. The Normal rainfall during 1998 was 732 mm, and actual rainfall was 1013mm. Dry air blows in the part of the year but humidity rises to 65-70 percent during monsoon months.”

(d) Humidity: During the monsoon the relative humidity is generally high, often exceeding 70per cent. There after humidity decreases rapidly and by the summer which is drier part of the year, relative humidity in the afternoon become less than 20per cent.

(e) Rainfall: Records of rainfall in the district are available at 4 stations i.e. Hapur, Ghaziabad, Modinagar and Garhmukteshwar. The average rainfall in the district is 648.6 mm. About 86per cent of the annual rainfall in the district is received during the summer monsoon months, June to September. July and August being the rainiest months. Rainfall in the district increases from the west to east.

(f) Temperature- There is no metrological observatory in the district. The description which follows is based on the records or observatories from the neighboring districts where similar climatic

conditions prevail. From about the end of February there is a rapid increase in temperatures. May generally the hottest month with a mean daily maximum temperature of about 41°C (96°F) and a mean daily minimum of about 27°C (80.6°F). Hot dust laden winds which often blow during the summer and to the pungency of the weather. With the onset of the monsoon the district by about the third week of June there is appreciable drop in day temperatures but in night continue to be warm as during the latter part of the summer season. After the monsoon withdraws from the district by about the third week of September, there is a slight increase in the day temperatures but the night rapidly become cooler. After the end of October day temperatures also decrease rapidly.

(g) Soil: The soil of Ghaziabad district is almost homogeneous. It is formed by the depositional work of rivers Ganga, Yamuna and Hindan. The kinds of soil in this district are loamy soil, Sandy soil, domat soil and clay Bhur. Broadly it may be known as.

1. Khadar
2. Bangar

Agriculture Land Use Pattern

The meaning and scope of land use is explained in outlines by *Zimmerman* in his book, “*World Resources and Industries*”. In fact ‘land’ is used by economist in a broader sense to denote natural resources in general. The problem, in that case, becomes one of resources appraisal. But, restricting the review to agricultural land, factors determining the limits of agricultural uses of land are being reflected. The land use has been classified as under:

- A. The General land use pattern
- B. The Agricultural land use pattern

A. General Land Use Pattern:

“A number of land distribution projects are initiated in India. It is essential that information regarding the present land use should be collected and land use potentials computed under wide variety of environments i.e.; *Physical, economical and social* to have broad ranges in land use planning” Land is an important basic natural resource for human survival. It comprises the physical environment including *climate, relief, soil, water and vegetation* all of which have influence on land use potential. “In the past, the general “land use was classified as *arable, meadow, pasture, orchard, forest land, non agricultural area.*” The General land use has been classified into six categories: -

1. Forest land
2. Cultivated Land/Agricultural Land
3. Uncultivable Land
4. Barren Land
5. Settlement
6. Pasture Land

B. Agricultural land use pattern:

“Agricultural land use constitutes the core of agricultural geography”⁶. Total cropped area in a year and in a aerial unit is called agricultural land use or cultivated land. Agriculture in Ganga Sutlej plain as well as in District Ghaziabad (Ghaziabad and Hapur) is a way of life and main stay and controller of economy. The main occupation of the district is agriculture. Hence the study of agricultural land use has much significance and pivotal role for its economic development. Besides, agricultural land use, emphasis will be given on their distribution of major crops and their production and yield. In the district Ghaziabad (Ghaziabad and Hapur) where agriculture is the mainstay of the people, engaging 22.10 per cent of the active workers, agricultural resource will perhaps be the most reasonable basis for planning the districts. It will, of course, involve the assessment of the existing land use patterns.

Distribution of Cultivable Lands

About 69.37 per cent of the total geographical area is occupied by cultivated in the year of 2016-2017. Thus the distribution of cultivable land may be classified as

1. One Crop area
2. Multi crop area

One Crop Area: Area cropped only once in a year or sown only once in a year is called one cropped area. It occupied about 62797 hectares area in 2015-16 out of the net cropped area 144684 hectares which was 43.70 per cent (64054 hect.) area in 2016-17. This area was about 40.59 per cent (58282 hect.) This decrease in one crop area was and is due to irrigational facilities; application of high and approved varieties of seeds; use of chemical manures and fertilizer, insecticides and pesticides; and

development of latest agricultural implements and technology. With the result day by day much more area is going to be converted into multi cropped area.

Multi Crop Area: Area cropped more than twice in a year is known as multi – crop area. “The multi crop area generally is situated near the urban settlements, umland and around the irrigational resources. Commercial crops, cash crops of short duration, cereal crops mixed with another cereal crops fruits and vegetables are pre – dominant among the crops to be included in multi crops” It requires multiple irrigational facilities. Intensive cultivation is practiced on this land with heavy manuring and irrigational facilities. Due to heavy demand of food crops and vegetables to people of area, farmers are trying their best to convert their one crop area in to multi crop area to their maximum use and fulfill the requirement .Observation and analysis reveal the changing land – use pattern in the district that one crop agricultural land use is perceptively giving way to multi crop land use.

Production of Major Crops

Since the beginning of the ‘Green Revolution’ in 1966-67 considerable changes have taken place in cropping pattern and production in Uttar Pradesh. An attempt has been made to examine the relative changes in the levels of production and yield per hectare of the selected food crops at the state as well as at the district levels. Out of total major crops grown in the district. Only following crops are under taken for discussion, they are:

- . Sugarcane
- . Wheat
- . Rice
- . Oilseeds
- . Potato
- . Barley

These six crops produce 3837814 M.Ton out of total production 3875357 M. Ton. The trend of growth under the thirteen crops with respect to area production and yield are significant in case of sugarcane, wheat, Potatoes, maize and oilseeds. The trend of productive growth is highest in area under sugarcane, which increased to 20 per centannual.

Crop- wise Production (2016-17)

Crop	Production (in M. Ton)
Wheat	306071
Rice	45971
Potato	83443
Oil seeds	2694
Barley	2117

Supply of Agriculture Raw Materials

“In developing country like India, it is not possible to make progress by depending on and encouraging agriculture alone, unless the two pronged approach, involving both agriculture and allied industries which can consume agricultural raw material, is adopted.’ “If the agriculture and industries, the twin pillars of economy, are well inter related and agro industries are developed in suitable areas2” like District Ghaziabad (Ghaziabad and Hapur). Sugarcane is the most important crop of the district and it is the only crop, which responsible for the growth of Sugar, Gur and Khandsari industries. Modinagar, Simbhaoli and Brijnathpur are the main centre of sugar industries. There are lot of agro industries, based upon agriculture raw materials such as *Oil Mills, Hand Weaving, Flour Mills, Rice Mills, Dal Mills and manufacturing of ropes, Twins and strings from fiber crops.*

(A) Direct Supply of Agricultural Raw Materials As an agro-raw material and its manufactured products assume great commercial significance and status, crop specialization, modernization in agriculture and industry takes place by creation of capital. This is demonstrated by the area’s heavy demand of agricultural inputs mainly fertilizers, irrigation equipment and agricultural light machinery. Farmers cultivate the crop more carefully with an economic and commercial sense and tend to specialized in a few profitable crops. Manufacturing sector also improve itself by improved technology and development of industrial complex. Specialization of crops and manufactured products is often observed as underlying the process of Industrialization. The whole agricultural products supplying raw materials to agro - industries are almost consumed locally.

- . Sugarcane
- . Wheat

- Rice
- Oil Seeds
- Barley

Sugarcane: Sugarcane is a tropical and sub tropical crop and grown in district since very remote time. It is demanding perennial crop: calling for heavy loam, considerable moisture requirement and absence of frost and making a heavy demand on labor. The set up of 3 sugar mills in District Ghaziabad (Ghaziabad and Hapur) is the main reason of healthy growth of sugarcane. Sugar Mills, Cane Crushers, Khandsari, Kohlus are attracted the business loving people to enter in to these industries. As a result of this, the heavy cane growth and organization of sugar industries supplement considered individually. Under the circumstances the acreage and production become greater day by day because they improved the socio- economic conditions of the cane growers. The entire cane produced in District Ghaziabad (Ghaziabad and Hapur) is directly supplied to Sugar and Gur manufacturing industries as raw materials holding appropriate amount for sowing intention as seed. There are 3 sugar mills which consume a great amount of cane and “the balance left by them is consumed by Khandsari Udyog crushing in cane crushers/sulphar plants running under the license of *Small Scale Industries* granted by the *Distt. Industry Centers* in their respective district, by village/ cottage Industries for preparing Gur and Jaggery financed by *Khadi and Village Industry Board*, and by farmers themselves for making Gur for their domestic use crushing them in their bullock driven Kolhus.” The cane is consumed by the following units as direct raw materials.

The sugar mills (Heavy Industries)

The Khandsari Udyog (Small Scale Industry)

Gur and Jaggery Udyog (Village and Cottage Industries)

Seeds for Sowing Purposes.

Wheat: “Wheat is widely cultivated as a cash crop because it produces a good yield per acre, grows well in a temperate climate even with a moderately short growing season, and yields versatile, high-quality flour that is widely used in baking. Most bread are made with wheat flour, even many breads named for the other grains they contain, including most rye and oat breads. Many other popular foods are made from wheat flour as well, resulting in a large demand for the grain even in economies with a significant food.” “Wheat was a key factor enabling the emergence of city-based societies at the start of civilization because it was one of the first crops that could be easily cultivated on a large scale, and had the additional advantage of yielding a harvest that provides long-term storage of food”

Rice: “Rice is the seed of the monocot plants *Oryza Sativa* or *Oryza Glaberrima*. As a cereal grain it the most important staple food for a large part of the Indian population”. Rice is grown in the mostly area of the district Ghaziabad (Ghaziabad and Hapur). It is the staple food of the district. “The type of rice that should be planted in the district depends on the altitude of our district and whether. We are living in a low land area”. “Wet or Low land cultivation is practiced in areas which have an assured and adequate supply of water either through rainfall or irrigation. The main difference between is the fact that seeds are not directly sown put Transplanted from nurseries as small plants or sprouted. Rice seeds in to puddle field. The land is ploughed thoroughly and puddle with around 3 to 5 cm of standing water to obtain a soft seed bed for the seedlings to grow quickly and reduce leaching of nutrients and weeds.” 17.25per cent percent of the cropped area under rice and the average production of rice in the district is about 41996 ton per annum.

Oil Seed: “Oil seeds have long been planted for local consumption and in the olden days the oils pressed from them were put to a variety of uses, such as lighting, cooking and a host of other purposes. Today the oils derived from oil seeds are used both for edible and industrial purposes.” The oil seeds which include the production of mustard seeds are consumed by local mills and expellers for domestic consumption as a direct supply of raw to them. There are 138 total oil manufacturing industries on small & cottage scale and 8 heavy industries and mustard expeller. They consume the total produce 692 M. Ton (of the area for oil retaining and the required amount for seeds. It is the chief source of lubricant and edible oil. The oil seeds mostly mustard seeds are consumed by local mills and expellers for domestic consumption as a direct supply of raw materials to them. There are 138 total oil expelling industries on small & cottage scale and 6 heavy industries and 119 mustard expeller. They consume the total produce 2120 M. Ton of the area for oil retaining the required amount of seeds.

Indirect Supply of Raw Materials

The residues of sugar mills such as Molasses, Bagasse etc, oil mills i.e oil cakes, rice mills as rice bran are supplied and used as raw materials to produce wine, paper, cattle feed and bran oils. These raw materials are the indirect supply from agricultural product.

Molasses: Cane molasses is a common ingredient in baking, often used in baked goods such as gingerbread cookies. There are a number of substitutions that can be made for molasses. For a given volume of molasses, one of the following may be used (with varying degrees of success): “Molasses can be used as the base material for fermentation into rum. Molasses is commonly used in dark brewed beverages like stout and very heavy dark ales. Molasses is added to some brands of tobacco used for smoking through a Middle Eastern water pipe (e.g., hookah, shisha, narghile, etc.). It is mixed into the tobacco along with glycerin and flavorings; sometimes it is used along with honey and other syrups or fully substituted by them. Brands that use molasses include Nakhla, Tangiers and Salloum.”

Bagasse: “Bagasse is the fibrous matter that remains after sugarcane or sorghum stalks are crushed to extract their juice.” It is currently used as a bio fuel and as a renewable resource in the manufacture of pulp and paper products and building materials. “Bagasse is defined as the fibrous residue remaining after sugarcane or sorghum stalks are crushed to extract their juice and is currently used as a renewable resource in the manufacture of pulp and paper products and building materials. Bagasse is used to make insulated disposable food containers, replacing materials such as Styrofoam, which are increasingly regarded as environmentally unacceptable (see Styrofoam bans). Insulated disposable food containers made of bagasse are now made available in local market through Casetta.”

Major Agro-Based Industries

‘Basic to an objective study of the role of the agro-based industries for prosperity of an economy is an understanding of the term “agro-based industries”. Unless the connotation of the term is clear, it will not be possible to appreciate the true purpose and potential of agro-based industries or assess their relevance to development’. Industries manufacturing “input” for agriculture or agricultural “output” or those industries which are supported by agricultural products are classified as “Agro-based Industries”. First of all, the agro-based industries provide the essential input and secondly they function as an outlet for agricultural output. At present this constitutes the backbone of a developing economy in this district. “Urban centres within Ghaziabad district serve as collecting, distribution and marketing center of agricultural ‘input’ and ‘output’ products and play a significant role in the development of agro-based industries”. Any technological improvement in either agriculture or in agro-based industries has a simultaneous impact on each other on one side and opens up new areas of development within the area on the other. The growth of tubewell irrigation in Ghaziabad district during first three plans is not only agriculture which has become independent from monsoon but has also increased the number of Sugar Industries, Rice Mills and Oil Mills. Similarly the increases in the acreage of Wheat, Rice, Cane and fodder crops have resulted in simultaneous growth of Flour Mills, Rice Mill, Sugar Mill and Dairy Industry. Service centers both big and small has played a dominant role in this achievement by providing an infrastructure for the development of agriculture and agro-based industries. Perhaps the prosperity of agro-based industries in this district is due to following facts.

1. The use of rural labour in the industry.
2. Engagement of farmers themselves when free from agriculture;
3. An impetus to the farmers to grow industrial crops; and
4. Quick returns both to the farmers and industrialists.

Distribution of Major Agro-Based Industries

“Ghaziabad the biggest Industrial center of upper Ganga Yamuna Doab, which is the most prosperous and progressive agricultural region in whole of U.P, enjoys a high reputation in respect of a few of the agro-based industries such as Sugar Industry, Oil Mills, Flour Industry, Khandsari, Gur and Jaggery Industry, breweries, and hand-loom”. There are 1604 (2016-17) registered industries in the district, in which only 560 are the working industries at present and the yearly production of these industries are 144294348 (Rs. in Thousand) in Ghaziabad. Out of the total registered employment of 63070 (2016-17) persons in the district, agrobased group of industries accounts for 34.16per cent share. This group of industries constitutes the largest single group at Modi Nagar, Pilkhuwa, Ghaziabad, Simbhaoli and Garhmukteshwar. Next in importance is sugar industry which is largely concentrated at Simbhaoli, Brijnathpur, and Modi Nagar. Other main industries of this group such as breweries, Flour Industry, oil mills are found at Ghaziabad but the total share of agro-based industries in the city represent only 10 per cent of the district’s total as against 34per cent share of the district as a whole in the total registered employment of the district. Spatially the greatest connection of agro-based industries in the district is found at Modi Nagar which accounts for about 59per cent share of these industries in the district. Next in importance is Ghaziabad city accounting for 28per cent share. Together these two

centers account for more than 85per cent share of agro-based industries in district Simbhaoli and Pilkhuwa jointly account for more than 10per cent share and the rest is represented by Hapur, Garhmukteshwar and Loni. At Ghaziabad, the main mode of agro-based industries exists at Mohan Nagar and Loni road industrial area, which together contains about 2/3rd of the total registered employment of agro-based industries in the city. The following table explains the functional pattern of industries

Functional Pattern of Agro-based Industries at Ghaziabad City

S. N	Name of the Industry	No. of Regd.Units	No. of Employment
1	Cotton Textile	150	28310
2	Breweries	10	14520
3	Fruit Products	20	2350
4	Hydrogenated Oil	30	7810
5	Tobacco Products	20	5450
6	Cereal Products	50	1800
7	Oil Mills and soap	10	6000
8	Jute Products	10	310
	total	300	66550

Source- Figures tabulated with the help of the list of factories (2017) obtained from Inspector of factories office and field survey.

“Another area where agro-based industries hold an important place is Bulandshahr road industrial area where important agro-based unit include M/s Hindustan Lever Ltd., M/s Amrit Vanaspati Co. Ltd., Webbing and belting factory and M/s Kailash Textiles. On Meerut road industrial area, there exist two important agro-based industrial units viz M/s. Jain Shudh Vanaspati Ltd., and International Tobacco Company which employ 318 and 494 persons respectively” “Cotton textile holds the most important place accounting for a little less than 50 per cent of the total registered in agro-based industries units at Ghaziabad. It is also one of the important industries of the city holding third place after electronics, and transport equipments. Next in importance is a brewery for which Ghaziabad enjoys a nationwide market. Other important industries at Ghaziabad belonging to this group include hydrogenated oil, edible oils and soap and tobacco products which account for 1.6 and 1.5per cent share in the total registered employment of the city. Other relatively less important industries of this group are fruits products, cereal products and jute products, all of which represent less than 1per cent share in the total registered employment of the city”. The followings are the major Agro-based Industries remaining in the District and will be discussed scientifically and systematically:

- Sugar Industry
- Cotton Textile
- Oil mill
- Flour Industry

Sugar Industries

“India is the home of sugarcane, and the production of Gur and Khandsari was known to be the Indians as early as 5000 B.C”.The industry received an impetus after independence. Even through most of the sugar acreage is concentrated in Ganga Plains, the majority of mills during the British rule was uneconomic. The quality and quantity of the cane, output per acre are much lower in the Ganga plains than in peninsular India. The problem of low yield low sucrose contents, low percent of recovery low per capita income and consumption and high cost of production are faced by sugar mills. As the domestic mascot of the sugar is ever expending with the spread of urbanization and industrialisation, the future of sugar industry seems bright. “In Atharva Veda, which dates back to the period 5000 B.C to 1000B.C there are account of cane cultivation and the production of Gur and Khandsari. The indigenous variety of cane of Ganga plains is established on physiological and botanical evidence, to be natural hybridization between the wild and tropical varieties”. It is evident that in the early of 6th century AD the sugar cane was introduced and grown under irrigable conditions into Iran from India.

1. Major sugar Industries –M/s Simbhaoli Sugar Mills Ltd, M/s
2. Brijnathpur Sugar Mills, M/s Modi Sugar Mills
3. Medium Sugar Industry- Khandsari
4. Small Sugar Industry Gur, Jaggery

Khandsari, Gur and Jaggery Industry

Khandsari Industries: - Khandsari Industries are the most important agro-based industries in Ghaziabad District. This Industry holds II position in consuming raw sugar cane. Khandsari industry stands side by side to the sugar mills and is subsidiary industry. Its development depends upon the supply of raw materials and the crusting capacity of the existing sugar mills. At present there are 130 Khandsari industries in district Ghaziabad. Khandsari units used open pan in place of vacuum pans for concentration and the sugar obtained is of lower quality compared to white sugar from mills. Sugar recovery in Khandsari is much lower. "There units depend on grid supply diesel generators for mechanical/ electrical power or both when grid power supply is erratic and diesel genets are kept as standby power sources. This increases the cost of production of Khandsari. Bagasse tops, dry leaves and molasses are byproduction." Modern sugar mills with co-generation meet their entire energy needs, both thermal and electro mechanical from these bagasse fired boilers-steam turbine units. They feed extra power to grid or save 15-20per cent bagasse for the use as feedstock or paper making. Jaggery promotional and regulatory measures have been taken by the government to improve quality and production. Large number of sugar mills is using outdated processes and equipment. Some of them not only use entire bagasse but also use wood. The Indigenous Production from Sugarcane is Khandsari Gur and Jaggery. At present there about 70 registered Gur making units in the district. The total investment in this industry has been Rs. 27,45,983/-. The total production was valued Rs. 879845 and 3658 persons are employed. Ghaziabad district about 16 Jaggery making units are on the record having total investment of Rs. 397236 The value of Jaggery and 1435 persons are employed. This industry is an old an indigenous. By product such as molasses and bagasse are exported to distilleries, tobacco manufacturing units and paper mills (Straw Board) respectively to the inside or adjacent units of the region. Paper mills of the region gets bagasse from sugar manufacturing units and consume them as their raw materials besides other grasses. A considerable amount of bagasses is consumed as fuel by Gur making units. "As sugarcane is cultivated all over India. There is immense scope for the development of the gur and Khandsari industry. The gur and Khandsari industry under Khadi and Village Industries Commission helps to ensure full utilization of sugarcane". Gur is a product which is used as a sweet instead of sugar, mostly in rural areas; the entrepreneur can receive 10-15per cent of the production value as profit. Gur and Khandsari can be sold at local hats and shops because of high demand in the rural area.

Cotton Textile: As a single industry manufacture of cotton textile hold an important place in the industrial structure of Ghaziabad city. It is the 3rd most important industry after electronics, and transport equipments, with 7.5per cent share in city's total registered employment. However, the city's share in the total registered employment of this industry in the district represents only about 20per cent while Modi Nagar which is one of the leading textile centers of Northern India accounts for more than 75per cent share.

Oil Industries: Mustard is a well-known oil seed and an annual crop. It has round stem with long inter-modes, simple, alternate and very soft yellowish green leaves. The fruit is a pod containing seeds. Dry mustard seeds are small, round and darkish-brown or grayish-brown in colour. They have no smell, but when pounded and moisture with water, they emit a peculiar strong smell. "Mustard oil is of vegetable origin and is obtained from seeds of the black and white (*Sinapis Alba*) mustard plants. In the crude state, black mustard oil (*Brassica nigra*, light color) has a spicy odor and a strong taste. When refined it is neutral in odor and taste. White mustard oil (yellow color) has a biting pungent taste due to the allyl mustard oil it contains." India is the fourth largest oilseed producing country in the world. Mustard seeds, rope seeds, lint seeds, soya seeds and palms are the main sources of edible oils. Oils are extracted from these seeds. Mustard oil is a well known oil seeds as well chief edible oil. Mustard oil is the largest edible oil produced in the world after Soy oil and Palm oil. At a production level of 13 - 14 million tons, it accounts for about 12 per cent of the total World's edible oil production. Mustard oil is composed mostly of the fatty acids oleic acid, linoleic acid and erucic acid. At 5per cent, mustard seed oil has the lowest saturated fat content of the edible oils.

The edible oils of vegetable origin are the most important sources of cooking oil. The district produced nearly 2483 Mt. (2001-02) oil mustard seeds. Mustard seed is the only oil seed crop and popularcooking oil of the district. Natural unrefined mustard oil extractedthrough cold process is quit pungent. The consumers of traditionalproduct prefer pungent oil. Till now the extraction of pungent oil could be possible only by Rotary Ghani due to mustard seed moisture range of 10-12 per cent, low temperature of extraction in wooden bowl wherein the pungent principal- allyl isothiacyanate does not evaporate. However, the expeller made of metallic components and high compression ratio raises the

seed temperature up to 80-100°C resulting in loss of pungent principles. The "Modern" oil expeller provides high pungency mustard oil by low temperature crushing

Flour Industry: Wheat is a major crop of the district Ghaziabad. It is mainly processed for flour, Maida, suji and Dalia. In last 50 years, harvest and post harvest technology of wheat has advanced substantially. The most significant development has been the use of self propelled harvester combines used for harvesting and threshing of wheat. Several factors are currently slowing the rate of district expansion of wheat production. Population growth rates are falling while wheat yields continue to rise and the better economic profitability of other crops such as sugarcane, linked with investment genetic technologies, has promoted shifted to other crops. The industry could grow on account of R &D input starting from the design and development of a Variety of threshing machines. Mud pins, wooden plank and mud plastered bins, gunny bags and metal bins have been in use by farmers for storage of wheat for food and for seed purposes. The traders and government agencies use gunny bags and go down type structures for storage of wheat. A number of commercial organizations have been offering processing units for handling, cleaning, grading, drying, storage, treatment and bagging of wheat for seed and food applications. Wheat is now increasingly being used in the form of bread, biscuits, suji and atta. Wheat is flakes and puffed wheat as breakfast cereals has been gradually picking up. Traditionally used smaller size atta chakkis may face problems of declining clientele. Better mechanized chakkis (with lower pollution level and better energy efficiency) are likely to increase in number. The number of roller flour mills is also likely to increase steadily, however majority of the mills may continue facing the problems of low capacity utilization and working capital constraints. These units would need to function through vertical integration of operations for sustaining profitability and achieve cost reduction through appropriate automation and computerization. Increase in demand is also expected in grain handling machinery, soil systems in grain markets and seed processing machinery.

Impact of Major Agro-based Industries on Socio-economic Development on society

For an all around economic development of the district a balanced development of natural resources is essential only one means of occupation neither can provide satisfactory employment conditions nor can ensure a sound economic background to a district. "Along with agriculture and some other industrial activities, utilizing, as far as possible, the local natural resources have also to be developed. One of the means of utilizing natural resources and releasing the pressure from agrarian economy is industry." Industries provide employment to technical as well as non-technical labour. Thus on the one hand they help in the solution of employment problem while, on the other they provide opportunity for the utilization of human as well as natural resources both from within and outside the district. This way, the industries form a part of the much broader process of economic development which involve the raising of standard of living through steady increases in the efficiency of factors of production. The pattern of living is considerably changed through the actual process of industrialization. For planning new and balanced socio-economic development of agro resource in future, a critical study of industrial situation is thus essential. "The economic development of an area is a complex task. Being an agriculture district, it has vast potentialities for economic development through agro- based industries which is a process of building up the capacity of the area to process the agro- based raw materials and then to manufacture goods either for consumption or for future production." Today agro-based industries constitute the backbone of developing economy. The agro-based industries have become an invaluable weapon in bringing into existence a harmoniously balanced integrated socio economic order. "The role of agro-based industries is most significant both in respect of employment and value added by manufacture, not only in the developing economies but also in the highly developed economies of the world." Friedrich List in the 19th century postulated a process of development proceeding from an agricultural stage through an agricultural stage to an agricultural-industrial-commercial stage. "Without industrial development economic progress has a relatively low ceiling. A consensus has arisen among development theorists and planners that for most countries, economic development must be viewed primarily in terms of industrialization."

Broadly defined, industrialisation is, "a process in which changes of a series of strategical production functions are taking place. It involves those basic changes that accompany the mechanisation of an enterprise, the building of new industry, the opening of new market and the exploitation of new territory. This is, in a way, process of 'deepening' as well as 'widening' of capital". Industrialisation is a basis of transformation. This transformation results in a series of interactions between the pre-existing agricultural society and the compulsions of industrialisation process. It touches upon behavior patterns, value systems, religious beliefs, structure of social groupings and economic

arrangements". The productivity of workers in industry tends to be considerably greater than in agriculture. "Agro-based industries generate the possibilities of co-operative societies. Development of agro-based industries in the co-operative sector is important. They help to strengthen other co-operative services such as supply of agricultural credit, marketing etc. In a subsistence economy of Ghaziabad district, integration of co-operative services with agro-based industries is vitally important, if the farmers have to grow vigorously and steadily important, The agriculturists and the processing units have mutual interests in more and better production of agricultural produce. The agro-based industries have created not only the economic opportunity but also the much needed self confidence in the community of farmers. It has provided a good integration and combination of rural and urban economics". Agriculture and agro-based industrial development are mutually interdependent and the development of the one can hardly be conceived without the development of the other. But in the scheme the agricultural development should precede agro-industrial development so that the surplus income secured in agriculture could find investment channels in agro-based industries.

As it has been said earlier that the role of agro-based industries in the economic development of Ghaziabad district is very vital. It generates the possibility and prosperity of socio-economic and cultural development. It is the agro-based industries, mainly sugar industry which provides a great potential of sugar cane and other agricultural raw materials. If the sugar manufacturing industries were not established in the district, the cultivation of sugar cane cannot be placed at first rank. This is the case with wheat cultivation which ranks second. Sugar cane is the chief cash crop of the area. It has been found that the agro-based industries are serving the area in its economic development in the following ways:

1. Introduction of latest means of science and technology and
2. agricultural implements;
3. Establishment of Educational and recreational centres;
4. Provide employment;
5. Improvement in purchasing capacity;
6. Mutual Cultural exchange
7. Good yield in quality and quantity both;
8. Development of means of transport and communication.

Secondly, the agro-based industries led the farmers to increase their yields in quality and quantity both. In sugar cane yield quantity dominates over quality because it is sold on weight basis instead of percentage of sucrose contents. The farmers have adopted the latest techniques to grow improved and disease resistant varieties of seeds. They have learnt the latest means of cultivation, developed and improved means of irrigation, use of chemical manures as per requirement, chemical examination of soil etc. "Now farmers are in a position to enjoy latest researches, and advice aired through mass media and agricultural universities i.e. Pantnagar and I.A.R.I. New Delhi. The protection and prevention of crops from insects and pests and the use of insecticides and pesticides to improve yield are very common. All these above methods have improved the yield in the area, mainly producing raw materials and hence developed the socio-economic condition." A suitable cultural exchange of tradition and customs is the fruitful result of agro-industrialisation in Ghaziabad district. The multi-cornered people with different tradition, customs and religion and belief, are enjoying the benefits secured from agro-industries, mainly sugar mills, cotton textiles, distillery, infant milk food factory, flour and other mills. The full culture diversity has firmly established itself as a way of life in this plain. Besides above, the agro-industrial development has put multidimensional development in the economy of the district. Agro-industries have been a boon to this plain. The inertia and conservatives of the farmers have dwindled. Farmers of Ghaziabad district are much more enlightened. The development of tubeweels, tubeweel irrigation, the growth and availability of more hydro-thermal power, the intensification of agriculture, the introduction of new service and marketing centres, the use of mass-media (Radio and T.V) and the generation of transport activity and infra-structure, the availability of capital (finance and machinery) through banks, the introduction of farm insurance facilities, the growth of truck farming, have all given a new life to Ghaziabad plain. This is a process through which we can transform the simple farmer from an unskilled worker to a highly skilled technical worker fit for absorption into high sophisticated industries (which is need of hour) through this means we prepare him mentally and physically to bear the responsibility of highly developed machine age-the way of life given by modern civilization.

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