Knowledge Paper Series
Kota Division, Rajasthan
Agri Value Chain
Overview of Kota Division

Rajasthan is the largest state in India (area of 340 lakh hectares). The State has a robust infrastructure, investment friendly environment, and optimal population density. Its strategic location makes it an important hub for trade and commerce. The state has strong agriculture sector which contributed to 26% of the state’s GSDP in 2015-16. Agriculture is a major driver for the state economy and Kota division plays an important role in the same.

Kota division comprises 4 districts namely Bundi, Baran, Kota and Jhalawar and is popularly referred to as the ‘Hadoti’ region. The area is well connected by road and rail transport and is about 250 km from the state capital of Jaipur. Kota division with a population of ~57 lakh is an agri-dominant region with rich soil type, strong irrigation systems and high yielding varieties of crops. The division has an area of 24 lakh hectares accounting for 7% of the total land area of the state. Of this area, 93% is cropped (~22.7 lakh hectares) which is significantly higher than the average cropped area of the state at ~76%. It has a rich produce of a variety of kharif, rabi and horticulture crops complemented by a growing animal husbandry sector. The division is well known for soybean, wheat, coriander, garlic and orange crops. The division also leads in agri-research and training infrastructure in Rajasthan. There are 2 agriculture research stations and 4 ‘Krishi Vigyan Kendras’ (KVKs) in the region which are continually involved in researching on seed production of dry land crops, increasing milk productivity of livestock through improved breeds and quality feed, developing skills among rural youth and farmers, and creating awareness amongst farmers on latest agro technologies. Apart from these, and 1 full-fledged soil, seed, fertilizer and pesticide testing lab and 6 soil testing labs are available in the region.

In order to promote the productivity of citrus fruits in the region and establish newer citrus varieties, 2 Center of Excellence (COEs) have been established in Jhalawar and Kota (CoE for Oranges: Kota; CoE for Citrus: Jhalawar).

On account of the robust agricultural produce, coupled with the strategic location and eminence of Kota from an agricultural perspective, it merits to deep dive into the agricultural value chain of the division and explore the plethora of opportunities that the region has to offer.

Kota Division: Agri Value Chain

The agri value chain of Kota comprises 3 key sectors namely – agriculture, horticulture, and animal husbandry.

Agriculture and Horticulture value chain

Source: Department of Agriculture, Government of Rajasthan
Inputs

The crops of this division account for productivity higher than the average yield of the state and, in some cases, higher than the average yield of produce in the country as well.

Average Yield (MT/Ha) in Kota Division, Rajasthan and India (2015-16)

Agriculture

- Wheat: 4.0 (Kota), 3.1 (India), 0.6 (Rajasthan)
- Soyabean: 1.5 (Kota), 1.2 (India), 0.7 (Rajasthan)
- Mustard: 1.3 (Kota), 1.3 (India), 0.7 (Rajasthan)
- Paddy: 3.6 (Kota), 2.4 (India), 0.8 (Rajasthan)
- Pulses: 3.0 (Kota), 0.7 (India), 0.6 (Rajasthan)

Horticulture

- Coriander: 1.1 (Kota), 0.7 (India), 1.1 (Rajasthan)
- Garlic: 5.4 (Kota), 5.4 (India), 5.5 (Rajasthan)
- Orange: 21.7 (Kota), 21.4 (India), 16.7 (Rajasthan)
- Guava: 13.9 (Kota), 10.7 (India), 13.9 (Rajasthan)

This is primarily on account of the fact that Kota division has...

- Ample high yielding seed varieties of a host of agricultural and horticultural crops
- Rich black alluvial soil
- Twice the average annual rainfall as compared to the state (Kota division: 874.2 mm; state average: 482.8 mm)
- Advanced farming practices adopted by the farmers
- High fertilizer consumption per hectare at 119.67 kg/hectare (State average: 52.64 kg/hectare)

Additionally, the state government has been supporting farmers with a consistent supply of seeds and assisting them with stocking of fertilizers.

Irrigation

50% (~12 lakh hectares) of the total area of the division is under irrigation as compared to 29% of the area under irrigation for the state as a whole.

The different modes of irrigation and the relative ranking of Kota division within the state has been documented below:

<table>
<thead>
<tr>
<th>Mode</th>
<th>Area (in hectares)</th>
<th>Division rank within the state</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tanks</td>
<td>13,003</td>
<td>2nd</td>
</tr>
<tr>
<td>Canals</td>
<td>363,908</td>
<td>3rd</td>
</tr>
<tr>
<td>Wells (incl. tubewells)</td>
<td>791,134</td>
<td>5th</td>
</tr>
<tr>
<td>Total gross irrigated area</td>
<td>1,205,865</td>
<td>3rd</td>
</tr>
<tr>
<td>Channel</td>
<td>Total number of channels in the division</td>
<td>Division rank within the state</td>
</tr>
<tr>
<td>Tubewells</td>
<td>68,602</td>
<td>2nd</td>
</tr>
<tr>
<td>Wells</td>
<td>135,333</td>
<td>3rd</td>
</tr>
<tr>
<td>Diesel Pump sets</td>
<td>94,943</td>
<td>3rd</td>
</tr>
</tbody>
</table>

The area under drip irrigation in Kota division is 5,100 hectares and accounts for less than 1% of the total area under irrigation (~12 lakh hectares).

However, if we compare this with the state which has ~17,000 hectares of drip irrigation, the Kota division seems to account for ~30% of the area under drip irrigation for the state and the same has been increasing at a CAGR of 13% over the last 4 years. Additionally, sprinkler irrigation is also gaining traction and hence these alternative modes, provide opportunity for further expansion.

These well-established modes of irrigation supplemented by greater than average rainfall in the state, assist the farmers to ensure higher output. However, there is a significant scope to propagate water conservation practices amongst the farmers of the division and attain the goals of "More Crop per Drop".

Source: Department of Agriculture, Government of Rajasthan
Key Sectors

Agriculture

The Kota division with its rich black alluvial soil, high cropping intensity and twice the average rainfall of Rajasthan boasts of several major kharif and rabi crops in the region.

Major kharif crops include soybean and paddy, while Rabi crops include wheat, mustard and gram.

Cereals and food grains account for over 75% of the total agricultural produce (5,486 thousand mt) of the division.

In terms of production statistics relative to the other divisions of the state (2015-16), the Kota division was ranked
1st in the state: Paddy, Pulses (urad, masur), Soybean
2nd in the state: Oilseeds (mustard, soybean)
3rd in the state: Wheat

Key Crops – Area, production and yield (2015-16)

<table>
<thead>
<tr>
<th>Crops</th>
<th>Area ('000 hectares)</th>
<th>Production ('000 MT)</th>
<th>Yield (MT/Ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat</td>
<td>537</td>
<td>2140</td>
<td>3.99</td>
</tr>
<tr>
<td>Soyabean</td>
<td>822</td>
<td>523</td>
<td>0.64</td>
</tr>
<tr>
<td>Mustard</td>
<td>245</td>
<td>356</td>
<td>1.46</td>
</tr>
<tr>
<td>Paddy</td>
<td>79</td>
<td>284</td>
<td>3.58</td>
</tr>
<tr>
<td>Pulses</td>
<td>118</td>
<td>97</td>
<td>0.82</td>
</tr>
</tbody>
</table>

Source: Department of Agriculture, Government of Rajasthan

Key agricultural crops and their contribution to the total state produce (2015-16)

<table>
<thead>
<tr>
<th>Major agriculture crops</th>
<th>Total state production ('000 MT)</th>
<th>Contribution of Kota division to the state produce</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat</td>
<td>10,468</td>
<td>20%</td>
</tr>
<tr>
<td>Soybean</td>
<td>804</td>
<td>65%</td>
</tr>
<tr>
<td>Mustard</td>
<td>3,258</td>
<td>11%</td>
</tr>
<tr>
<td>Paddy</td>
<td>555</td>
<td>51%</td>
</tr>
<tr>
<td>Pulses</td>
<td>1,952</td>
<td>5%</td>
</tr>
</tbody>
</table>

Source: Department of Agriculture, Government of Rajasthan
In order to effectively leverage the growing demand for organic produce in India and internationally (Indian organic export and domestic market grew by 30% and 40% respectively), farmers of the division could be supported by educating them of the long term benefits of natural farming by creating self-help groups, conducting workshops and information centers.

Better realisation for organic produce and a strong marketing support for these crops will enable the farmers of the region to double their incomes over the next few years.

Organic Farming
Rajasthan is one of the largest states in India partaking in organic farming, with over 69,750 hectares of registered organic farm area.

In order to encourage organic farming, the state government, in April 2016, identified 11 districts that would focus primarily on organic farming and Jhalawar district has been earmarked as one of them. Towards this, a self-help farmer group has been created in the district that assists farmers to realise a higher value (~30-40% higher than regular output) for their produce.

Organic farming for horticulture in the Kota division is at a nascent stage currently. A brief overview has been provided below from a horticulture standpoint:

Organic Farming: Kota division horticulture crop cultivation area (2015-16)

<table>
<thead>
<tr>
<th>Type of horticulture crop</th>
<th>Area (in hectares)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coriander</td>
<td>4,000-5,000</td>
</tr>
<tr>
<td>Garlic</td>
<td>30</td>
</tr>
<tr>
<td>Vegetables</td>
<td>18-20</td>
</tr>
<tr>
<td>Flowers (Rose, Marigold)</td>
<td>4-5</td>
</tr>
</tbody>
</table>

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Source: Department of Agriculture, Government of Rajasthan

Horticulture
Horticulture is a predominant sector for Kota division, as this region is the world’s largest producer of coriander and India’s 4th largest producer of oranges and garlic. The yield of key horticulture crops in Kota division is in line with the average yield of the state. Over the last 4 years, significant increase has been witnessed in the production or oranges (production-CAGR: 26%) and Garlic (production-CAGR: 14%) and high yields have been reported as well.

Kota division has 4 government horticulture nurseries that are providing quality planting material to the farmers.

Key Crops – Area, Production and Yield (2015-16)

While the current Guava production is low in the region, the yield is higher than the state average & with a focus on organised procurement facilities, the production may see an uptake.
In order to augment the production of higher yielding and varying varieties of orange in the region, the State Government in association with the Government of Israel has set up a CoE for Citrus Fruits in Kota and CoE for oranges in Jhalawar. These CoEs propagate among the farmers the methods of crop cultivation and has a state-of-the-art washing, grading and cold storage facility.

Garlic production is gaining momentum and its production has doubled with a 97% increase in yield over last year.

Coriander is grown in large quantities and in order to realise the true potential of the high cultivation in the region, effective cold storage facilities could be provided to minimize wastage.

Hence, in order to reap significant benefits from these high yielding horticulture crops, it is essential to establish storage and processing facilities in the division.

Protected cultivation in Kota division is at a nascent stage and can be a boon for the farmers of the region. Currently, 5.6 hectares of land is under protected cultivation and the key crops include capsicum (red, green and yellow), cucumber and a few variety of flowers.

In a bid to promote protected cultivation in the area, the State Government has rolled out a scheme for providing 75% subsidy to the farmers to support initial investment (~INR 35 lakh for 4,000 sqm).

Investment in this sector will reap multiple benefits to horticulture farmers of the region and there is a strong case to support the same.

Animal husbandry is an integral part of agriculture and allied activities. It involves breeding and raising livestock such as buffaloes, cows, goats, camels, and extends to poultry farming and fisheries.

These animals not only provide milk and nutrient-rich food products for human consumption but are an important source of organic manure (such as dung) thereby facilitating an additional income for farmers. Animal husbandry and allied activities supplement a farmer’s income and provide protective insurance against agriculture income fluctuations caused due to crop failure and natural calamities.

The Kota division has 6% of the State total livestock and over 500 animal husbandry institutes (which includes polyclinics, first grade veterinary hospitals, etc.) accounting for 8% of the total establishments of the state.

While agriculture is dominant in the division, the 3 key sectors under animal husbandry that have a strong presence are Dairy, Apiculture and Poultry.

### Key Horticulture Crops of State and their % contribution (2015-16)

<table>
<thead>
<tr>
<th>Major horticulture crops</th>
<th>Total state production ('000 MT)</th>
<th>Contribution of Kota division to the state produce</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coriander</td>
<td>227</td>
<td>95%</td>
</tr>
<tr>
<td>Garlic</td>
<td>377</td>
<td>75%</td>
</tr>
<tr>
<td>Orange</td>
<td>267</td>
<td>98%</td>
</tr>
<tr>
<td>Guava</td>
<td>41</td>
<td>24%</td>
</tr>
</tbody>
</table>

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Institutionalised branding and marketing of local cow breeds coupled with enhanced milk productivity will reap big dividends for the farmers of the State.

### Key statistics of the Dairy Sector in Kota Division (2015-16)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Kota division statistics</th>
<th>Division as a % of state</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cattle (Number)</td>
<td>1.2 mn</td>
<td>10%</td>
</tr>
<tr>
<td>Milk production</td>
<td>1.13 mn mt</td>
<td>6%</td>
</tr>
<tr>
<td>Dairy cooperative societies (Number)</td>
<td>971</td>
<td>7%</td>
</tr>
</tbody>
</table>

Kota’s milk production is about 6% of the state’s production with 10% of the cattle population. There is a scope to improve yields of the two indigenous breeds – Gir (~7 ltr. of milk per day) and Malvi (~3 ltr. of milk per day) that are well known for their A2 type milk.

A1 and A2 beta-casein are two types of proteins found in different milk variants, and this is determined by the breed of cow the milk came from. Globally, A2 milk is being marketed as a healthier choice and Rajasthan’s Gir and Malvi breeds fall under this category. Institutionalised branding and marketing of local cow breeds coupled with enhanced milk productivity will reap big dividends for the farmers of the state.

Given that there is a scope to improve the current productivity levels, it becomes important to improve the breeds of the cattle through techniques like artificial insemination. Most farmers of the region need to be trained and educated of the benefits of artifical insemination and a robust infrastructure around the same needs to be established.

Livestock feed is an important constituent of animal husbandry. Given abundant soybean production in the area, setting up of soymeal processing facilities is a big opportunity.

Other opportunity areas lie in the organised milk procurement and processing infrastructure. The existing milk procurement per day by the cooperatives in the division is about 4% of the total production. Whilst the milk production is ample, there is a significant scope to elevate the organised procurement and processing of milk.
With increasing demand for value added products and a large student population (1.5 lac students enrolled each year in Kota) there exists a opportunity not only for improving procurement levels but also for dairy processing and catering to the resident demand of the division itself.

**Apiculture**

Kota division has a strong potential for growth in Apiculture. Currently, it is at a nascent stage as the farmers have been practicing bee keeping only from 2005-06 onwards. Currently, the division produces ~375 MT of honey annually.

Currently there are 14,000 boxes in the region, each producing 25-30 Kg of honey every season, with 400-450 farmers involved in the process. The Kota division has been adding 1,400-1,500 boxes every year over the last decade.

To support the farmers, the government provides a subsidy of 40% on the cost of box (Cost of one box/bee colony is ~ INR 2,000) up to a maximum of 50 boxes. Additionally, the government has undertaken efforts to promote apiculture in the region, by imparting training and education to the farmers.

Bee pollination is specifically helpful in case of mustard farming, as it not only assists in increasing the yield but also helps in improving the quality of the produce. Hence, mustard farmers need to be encouraged to invest in bee keeping and benefits of the same should be highlighted to them enabling them to add an incremental income.

However, bee keeping in the region is migratory in nature, on account of high temperatures in the summer and low availability of the flora during parts of the year and hence, some marginal farmers find it difficult to rear bees.

Hence, it would merit to create an association to bring together farmers and thereby improve unit economics and overall profitability for beekeeping.

**Produce Management**

**Agri Marketing**

The Kota division has 16 mandis (Rajasthan: 147 mandis) that deal in ~25% of the agricultural produce traded by the state. 59% of the spices and 35% of the cereals traded in the state are in the Kota division.

**Mandi arrival: Produce traded (in terms of volume) in Kota mandis.**

<table>
<thead>
<tr>
<th>Produce</th>
<th>Mandi arrivals in Kota division (in ‘000 MT)</th>
<th>Trading in division as % of total trading in the state</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spices</td>
<td>200</td>
<td>59%</td>
</tr>
<tr>
<td>Cereals</td>
<td>1,930</td>
<td>35%</td>
</tr>
<tr>
<td>Oilseeds</td>
<td>760</td>
<td>27%</td>
</tr>
<tr>
<td>Pulses</td>
<td>70</td>
<td>10%</td>
</tr>
<tr>
<td>Others*</td>
<td>360</td>
<td>7%</td>
</tr>
</tbody>
</table>

* Others include fruits and vegetables, garlic, sugar, mehandi, guar, etc.

Source: Department of Agriculture, Government of Rajasthan
The Seth Bhamashah Mandi in Kota is the one of the largest mandis in India (in terms of traded volume). The mandi deals in a variety of produce, including but not limited to, wheat, paddy, soybean oil seeds and coriander. The mandi has about 40-50 sorting and grading plants and electronic weighing systems.

Key crops traded in Bhamashah Mandi (2015-16)

<table>
<thead>
<tr>
<th>Key crops</th>
<th>Quantity traded in 2015-16 (in '000 MT)</th>
<th>% of contribution of the crop in total mandi trade volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat</td>
<td>410</td>
<td>45%</td>
</tr>
<tr>
<td>Paddy</td>
<td>190</td>
<td>21%</td>
</tr>
<tr>
<td>Soybean oilseeds</td>
<td>110</td>
<td>12%</td>
</tr>
<tr>
<td>Mustard oilseeds</td>
<td>80</td>
<td>9%</td>
</tr>
<tr>
<td>Coriander</td>
<td>60</td>
<td>6%</td>
</tr>
</tbody>
</table>

Note: Other key crops such as garlic, oranges and soybean are traded in other mandis (including but not limited to Ramganj Mandi, Bhawani Mandi) in the division.

The division has 15 other mandis that provide comprehensive infrastructure for trading, agro financing and elementary sorting and grading of produce. Additionally, in order to create a unified market through online trading platform, 5 Electronic – National Agriculture Markets (eNAM) have been institutionalised in the division.

Kota division has a number of warehouses, which store a variety of crops such as wheat, soybean, pulses, mustard and coriander.

Processing facilities

Kota division is dominated by rich, high yielding varieties of agricultural and horticultural crops and has a well-established animal husbandry sector.

Good processing facilities are critical for realising the true potential of the produce yielded in the region. Around 140 SME units have already been established in the region, around grain milling and manufacturing of food products. However, produce such as soybean, pulses and spices need specific focus with regards to advanced grading, packaging and sorting of the output.

For horticulture crops, there are currently over 20 processing units operating primarily for coriander and orange. However, the facility capacities are not commensurate with the production in the division.

For dairy milk processing, Rajasthan Cooperative Dairy Federation (RCDF) currently operates 2 units with a capacity of 50,000 ltr. and 20,000 ltr. per day in Kota and Jhalawar respectively. Apart from RCDF, there are other private players as well. However, emphasis needs to be laid on manufacturing of value added dairy products.

Hence, there exists substantial room for expansion and potential for value addition in the region.

Summary

Based on an assessment of the current scenario of the agriculture sector in Kota, the key opportunities that emerge for the major crops and under animal husbandry section have been identified below.
<table>
<thead>
<tr>
<th>Major Crops</th>
<th>Strengths</th>
<th>Areas of improvement</th>
<th>Opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Agriculture</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mustard</td>
<td>• High production with increasing area under cultivation (Increase of 21% over last year) • Good infrastructure available for sorting, grading and storage of the crop</td>
<td>• Focus on warehousing facilities • Need for advanced processing facilities for oil extraction and value added product manufacturing</td>
<td></td>
</tr>
<tr>
<td>Wheat</td>
<td>• Higher yields than the state’s average (3.969 kg/hectare vs. 3.367 kg/hectare) • Good agro marketing facilities available</td>
<td>• Focus on warehousing facilities • Need for advanced processing facilities</td>
<td></td>
</tr>
<tr>
<td>Agro-Forestry</td>
<td>• 16% of the state’s forest cover and trees that enrich soil and help in land regeneration</td>
<td>• Need to strengthen marketing • Strengthen processing facilities</td>
<td></td>
</tr>
<tr>
<td><strong>Horticulture</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Garlic</td>
<td>• Production has doubled since last year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Orange</td>
<td>• Division accounts for 98% of the State’s orange production and 2 CoEs’ are established in the region</td>
<td>• Focus on different variants to process value added products • Need for better branding • Need for processing facilities for producing value added products</td>
<td></td>
</tr>
<tr>
<td>Guava</td>
<td>• Division accounts for 24% of the State’s guava production</td>
<td>• Need for better cold storage infrastructure • Need for better branding • Need for processing facilities for producing value added products</td>
<td></td>
</tr>
<tr>
<td>Medicinal plants</td>
<td>• Favorable soil and climatic conditions for cultivating plants such as ashwagandha and isabgol</td>
<td>• Need for appropriate storage facilities • Need to focus on marketing and branding</td>
<td></td>
</tr>
</tbody>
</table>

Note: Not an exhaustive list. The opportunities highlighted above, are the ones that might merit an immediate attention.
<table>
<thead>
<tr>
<th>Major Crops</th>
<th>Strengths</th>
<th>Areas of improvement</th>
<th>Opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dairy</td>
<td>Local breed of cattle yielding milk rich in A2 type protein</td>
<td>Need to focus on high yielding variety of cattle</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Focus on improving procurement levels from organized sector</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Need for processing facilities for producing value added dairy products</td>
<td></td>
</tr>
<tr>
<td>Apiculture</td>
<td>Bee keeping increases yield of mustard which is grown in abundance in the region</td>
<td>Need to propagate this further</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Focus on processing of raw honey and value added products</td>
<td></td>
</tr>
</tbody>
</table>

Legend
- Storage infrastructure: Adequate warehouse, silos and cold storage facilities
- Marketing: Includes grading, sorting, packaging and branding of the produce
- Processing: Includes both Level 1 and Level 2 processing facilities
- ✓: Might merit an immediate attention

The Government of Rajasthan has invested significantly towards improving the key elements in the agri value chain of Kota whilst simultaneously promoting the uptake of modern technologies and imparting farmer education.

In order to further this cause, and ensure end to end linkage in the value chain for all 3 sectors, the below mentioned opportunities emerge.

Note: Not an exhaustive list. The opportunities highlighted above, are the ones that might merit an immediate attention.
Opportunities under each of these segments have been identified below.

**Storage & Post-harvest infrastructure:**

Kota division plays a key role in the overall agriculture & horticulture crop production of the state. Production of some key crops such as wheat, paddy, etc. has grown in recent years. This opens up numerous opportunities for investment in storage facilities. As noted earlier, Kota has a number of government and private warehouses. However, there is scope for furthering the storage infrastructure to keep pace with growing production.

- **Investment Potential**
  - **Grain storage silos:** Storage in silos provides with multitude of advantages such as cost-effectiveness and convenience. It saves the depositors the costs of loading, unloading and bagging the produce at the mandi. The division has recently seen private investments in terms of development of silos. NCDEX in partnership with Star Agri launched a 4 silo facility with a total capacity of 20,000 tonne, for storage of wheat. Additionally, there are other private investors who have established silos in the division, specifically for soybean storage.
  - Investments should be considered in setting up silos in areas closer to the actual production, to prevent post-harvest losses.
  - These investments in specialised silos could be considered for key crops like soybean, paddy and mustard.

**Processing & Valur-addition**

Opportunities explored in agri-marketing, animal husbandry and agro-forestry

**Allied Sectors**

Opportunities under these segments have been identified below.

**Agri-Marketing:**

As noted earlier, Kota is home to one of the largest mandis in Asia along with a number of other mandis, where large volumes are traded everyday. There is scope for improvement in the infrastructure and operations of these mandis.

- **Digitisation:**
  - Further Promotion of e-NAM: Kota division currently has 5 mandis that are connected to the e-NAM system, one of which is the Bhamashah Mandi, that is amongst the largest in the country.
  - However, the adoption of the platform among the farmers is still low (~1-2%).
  - Further emphasis should be placed on promotion of the channel.
  - Government could invest in more manpower and technological solutions to educate and register farmers on to the platform at the mandi locations.
  - Further investments would be needed in basic infrastructure such as warehouses, storages and inventory management systems to assist the farmers in storing produce before and after trading hours.
  - Electronic weighing: While the Bhamashah mandi has already adopted this, incremental efforts would be required to institute electronic weighing at all mandis in the division.

**Specialised/ Private Mandis:** Private mandi yards can help farmers in a number of ways including:

- Providing an alternative channel for the farmers’ produce.
- Provision of an organised market in uncovered areas.
- Ensuring competition among the mandi and can lead to better realisation for farmers with better quality produce.

One of India’s leading warehousing corporations has already planned to open one such mandi in Kota. Further propagation of such mandis could be very beneficial for the farmers, and private players could also be incentivised by the government to undertake such initiatives.

**Mandi for Medicinal Plants:** These plants currently do not have a specialised marketing platform (Mandi) in the division. Such platforms could be established to promote further production.

**Cold Storage Infrastructure**

Investments have been made in the cold-chain infrastructure in recent years. Facilities for key horticulture crops such as citrus fruits, coriander, etc. have been established. However, there is still a gap between the demand and supply for cold storage.

- Garlic: Garlic is predominantly a Rabi crop. However, it is required for consumption all year round. Longer term storage of the produce also requires specialised conditions.
- There is immense scope for investment in specialised cold storage structures for garlic in the Kota division.
division since such storage facilities are not sufficient and not specialised enough for the production in the region

- Citrus fruits: In the last year, 3 new cold storage facilities have been established in areas of orange production. However, the infrastructure would require further expansion to meet the needs of production in the region

- Guava:
  - Currently guava lacks an organised procurement channel, and most farmers sell the produce locally which does not fetch them good realisations. An organised procurement channel will be highly beneficial in this regard.
  - Cold storage facilities have already been established for guava in the division, however given the significant production of the crop, there exists an ample opportunity for further investment

- Medicinal Plants: Medicinal plants require careful and specialised post-harvest storage and transportation. The produce has to be prevented from any kind of contamination and has to be protected from heat and rain during transportation. Hence, investments could be made in the proper storage and transportation of the produce.

d. Farm Mechanisation & Custom Hiring Centers
Rajasthan is a major proponent of farm mechanization in India, accounting for 9% of the tractor sales in the country. The state has seen a significant shift towards farm mechanization, synonymous with the robust growth in agricultural production, with the installation of sprinklers, water pumps, usage of tractors, tillers, etc.

The advantages of farm mechanization lie in increasing efficiency, saving labor time and driving sustainability across the agri-value chain. The Government of Rajasthan is committed to increasing the level of mechanization in the state, thereby increasing the productivity of its crops.

The government is jointly working with the private players to develop CHCs in the state. The state government has already signed 3 MOUs with leading farm mechanization players TAFE, Mahindra and Mahindra and John Deere totaling worth ~INR 1,600 Cr to set up around 2,600 Custom Hiring Centers (CHCs) in the state.

Future Potential
The Kota Division leads in Rajasthan in the production of agricultural crops such as Paddy, Soybean, Wheat, Mustard, etc. The production of crops such as these naturally leads to the usage of tractor drawn harvesting, threshing machines and combines to efficiently sow, reap and gather produce.

Currently, a large base of farmers and other stakeholders of the Kota division hire tractors, combine threshers and other large farm equipment from other divisions such as Ganganagar etc. and even from other neighboring states of Punjab, Haryana and Madhya Pradesh during sowing/harvesting season.

Given that the local production levels of crops of wheat, mustard and paddy are growing significantly, it creates a strong case for elevating the farm mechanization levels in the region.

However, given small land holdings, it is difficult for the farmers to own and employ large scale farm mechanisation. Small and marginal farmers are usually unable to own farm machinery on their own or through institutional credit. The Department of Agriculture also provides a back ended subsidy of up to 40% for the establishment of CHCs.

In this regard, there are opportunities for establishing CHCs for farm machinery & implements in the division, considering the unique position it holds in the state’s agricultural scenario. Some of the equipment and implements that may be lent/ provided through CHCs are:
  - Seed-cum-fertilizer drill, zero till drill, land levelers
  - Seed dressers, sprayers, weeding implements and other drudgery reduction implements
  - Tractor and various tractor driven farm implements
  - Combined harvesters and threshers

2. Processing & Value Addition
As noted above, Kota division has a large production for a number of key crops. However, the level of processing and value-addition being done in the division is still low. This opens up possibilities for investment in establishing processing units for these crops.

Agriculture Crops
a. Wheat Processing
Wheat not only forms the backbone of Indian agriculture, it is also an essential crop for Rajasthan and the Kota division. Kota division contributes 20% of the state’s wheat production (FY’16) and provides significant opportunity in the wheat processing.

Value chain of Wheat

<table>
<thead>
<tr>
<th>Total Production</th>
<th>Countries</th>
<th>End Consumers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic Use</td>
<td>Food/Insutrial</td>
<td>Milling</td>
</tr>
<tr>
<td>Wheat Starch</td>
<td>Wheat Flour</td>
<td>Wheat Gluten</td>
</tr>
<tr>
<td>Wheat Flour</td>
<td>End Consumers</td>
<td></td>
</tr>
<tr>
<td>Feed/Residual</td>
<td>End Consumers</td>
<td></td>
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</tbody>
</table>

Source: MCX India
Investment Potential

Despite the large production seen in the division, the level of processing of wheat is limited across all 4 districts. Opportunities that exist in the division include:

- **Wheat Flour milling and packaging:**
  - Majority of the wheat flour milled in Bundi, Baran and Jhalawar districts is for local consumption by smaller local players. Opportunities exist in establishing more such milling plants for local consumption and growing population. Currently, there are multiple commercial wheat flour milling units in the Kota district, however, very few private players are present. There is scope for addition of more such milling plants for the manufacture of packaged and branded wheat, specifically, to cater to the student canteens and restaurants which have a significant presence in Kota.

- **Value-added Products:**
  - Production units for value added products such as biscuits, bread rolls and bakery products
  - Units for other ready-to-cook products like kitchen staples such as cereals, noodles, pasta, sewai, etc.

- **Other Usages:**
  - Biodegradable plastics from wheat starch: The demand for biodegradable plastics is on the rise, especially among end users who prefer 'eco-friendly' solutions
  - Wheat-based raw materials for cosmetics: Such raw materials have a number of usages in the cosmetics industry, such as:
    - Wheat germ oil naturally is utilised as a skin conditioning agent
    - Wheat gluten is used in makeup, hair conditioners and skin conditioners due to its binding effect
    - Wheat germ glycerides are used in the manufacture of lipsticks and moisturisers

b. Soybean Processing

Rajasthan is a leading producer of soybean in India, however, few soybean processing plants are present in the region and most of those are being utilised only for oil extraction.

Investment Potential

Opportunities for investment exist in the next level of value-addition to manufacture a number of different products:

- **Soymeal & Animal Feed:** Opportunities exist in the division for investments in soymeal processing facilities. Soymeal and animal feed are important from an export perspective as well.

- **Soy-based foods:** Global consumption of soy-based foods, especially tofu and soy milk, is growing. The market for soy milk itself is expected to show double-digit growth to reach USD 1.7 billion in the Asia-Pacific region by 2020. Opportunities exist for manufacturing of soy-based foods in the division.

- **Soy Paste & Sauce:** Soy paste and sauces are popular not only in the eastern countries but also widely used in the west, especially in the United States.

- **Industrial Products:** Soybeans are also used in the manufacture of a number of industrial products such as resins, plastics, varnishes and paints. It can also be used for products such as soaps, disinfectants, insecticides, printing inks, etc.
The local variety of mustard has 40% oil content, which allows opportunities in oil extraction.

c. Mustard Processing
Rajasthan is the largest producer of mustard in the country and a significant proportion of that production can be attributed to the Kota division (~11% of the state’s production).
There are 8 soy processing plants in the division which are utilised for the mustard crop after the Rabi season, when the capacity is not being used for soybean. The division has strong production of the crop and good infrastructure available (for sorting, grading and storage of the crop), but the level of mustard processing in the division is quite limited.

Investment Potential
The opportunities pertaining to further processing of crops include:

- Pharmaceutical Industry
- Condiment
- Home Consumption
- Industrial Usage
- Animal Feed

Each of the above mentioned opportunities have been described in detail below:

- **Seed**: Utilised as a condiment in food preparation - Marketing of mustard as a spice from Rajasthan. It is also utilized in the pharmaceutical industry (manufacturing of laxatives, muscle pain relievers, etc.).
- **Oil**: The local variety of mustard has ~40% oil content, which allows opportunities in oil extraction. Potential investment opportunities include:
  - Refining of crude oil to produce edible oil, which is utilised as a cooking medium and for pickling purposes
  - Mustard oil is also used in the manufacture of sauces, salad dressings, etc.
- **Oil**: The meal obtained after oil extraction has high protein level and hence is a valuable animal feed
- **The oil is also used in industries such as paper, textile and Plastics, etc.**


d. Paddy Processing
Given the large-scale paddy production in the division, a number of investment opportunities exist:

- **Milling operations for exports**: Locally produced rice, due to its high quality, is exported to a number of countries, especially in the Middle East. There is scope for further expansion of milling operations to further exports.
- **Value-added product manufacturing**: Varieties grown in the division are of very high quality and allow further processing for products such as rice bran oil and rice flour. These can in turn cater to a number of product categories.
  - **Rice Bran Oil**: Global rice bran oil market has shown steady growth to reach a production volume of 1.5 mn MT in 2016. The demand for the oil is expected to continue growing, given the numerous health benefits.
  - Manufacturing units for edible grade oil and plasticisers (utilised in plastic and rubber industries) could be set up.
  - Soap manufacturing units could also be established since rice bran oil with high free fatty acid (FFA) content is highly suitable for the manufacture of soft soap and liquid soap.
  - Rice bran oil is also gaining prominence in the cosmetics sector.
  - **Rice Flour**:
  - Rice flour can also be used to make extruded rice, which can be used as ready-to-eat form in different flours.
  - Units utilising rice flour such as those for manufacture of cereals, baby foods and even starch production (which is used in manufacture of food safe adhesives) could be considered.
  - Rice flour is used in the confectionery and bakery sectors in the preparation of gluten-free products. Such foods are gaining popularity worldwide due to their health benefits.

Horticulture Crops
e. Coriander Processing and Marketing
With 95% of the state’s production, Kota division dominates coriander production landscape in Rajasthan. It is not only known for the vast quantity of crop produced but is also noted for the quality of the produce. However, there is scope for improvement for both processing and improving the seed varieties to include more oil content in the local produce.

Investment Potential
Recently, ~20 processing (grading/grinding) units for coriander have been established in the division. There is scope for investment in the post-harvest management of the coriander production, given the large-scale and high-quality production in the region:

- **Seed**: Seeds of the plant can be used as a condiment. It is also a key constituent of curry powder, which in turn is very often used in the preparation of curries and soups.
- **Oil extraction**: Oil extracted from coriander seeds has numerous benefits and is used in a number of applications including:
  - The meal obtained after oil extraction has high protein level and hence is a valuable animal feed
  - The oil is also used in industries such as paper, textile and Plastics, etc.
industries globally. India is significantly dependent on imports of coriander seed oil, hence new crop variety introduction and the subsequent processing to extract oil could lower the import reliance. Oil extraction also opens up further opportunities, in both domestic and international markets, in industries like pharmaceuticals, perfume manufacturing, preparation of alcoholic beverages. However, as noted above, oil content in the locally grown variety of coriander is low, and hence oleoresin extraction might not be possible from it. Hence, there is an opportunity to introduce a new variety of crop with higher oil concentration to allow establishment of oil extraction and further establishment on manufacturing units for value-added products.

- Processing for pharmaceutical industry: Further opportunities also exist in manufacturing industries for making products that use coriander as an ingredient such as pharmaceuticals (improving hematopoietic functions, treating microbial infections in farm animals, etc.), tooth paste, mouth wash, gelling agent, absorption agent, etc.
- Superior marketing: Packing and branding operations for coriander in the division could be undertaken. This would allow marketing the local produce as ‘Rajasthan or Kota coriander’ (as seen in the case of RajOlive)

f. Garlic Processing
Garlic’s eminence in the division has been increasing. There has been an increase in production by ~100% and production amounted to 2.82 lakh MT in 2015-16, which accounts for three-fourths of the state’s garlic production. It also has two CoEs focusing on citrus fruits, orange in particular, further demonstrating the importance of the crops in the state.

Investment Potential
- Dehydrated Garlic, Garlic Flakes and Garlic Powder:
  - Dehydration and conversion to garlic flakes helps reduce the bulb losses during storage and in turn can reduce the transportation cost of the commodity.
  - Conversion of garlic into a powder form is important from an export perspective, especially for Europe and USA.
  - Various products of garlic such as garlic oil, dehydrated garlic powder, garlic juice & extract and pickled garlic can also be prepared.
- Food Processing: Garlic provides number of opportunities as an ingredient in the food industry:
  - It is not only utilised as a condiment, but is also used in the preparation of tomato ketchup, salad dressings, gravies, pickles and curries.
  - Garlic paste is widely used in the food industry especially in restaurants, fast-food outlets, hotels and other commercial kitchens.
  - Garlic essential oil, extracted by steam distillation of freshly ground cloves, is utilised in making beverages, ice-creams, confectionery & bakery goods, chewing gum and condiments.
  - Medicinal Usage: Garlic has immense potential for medicinal usage, especially in helping clear coughs, psoriasis, yeast infections, as a skin cleanser, etc.

g. Orange processing
Kota division is a key region for the production of citrus fruits. In 2015-16, the division contributed to 98% of the state's orange production. It also has two CoEs focusing on citrus fruits, orange in particular, further demonstrating the importance of the crops in the region.

Private players could establish processing plants in the division for citrus fruits based on contract farming model.

Investment Potential
Given the large production level, there are a number of opportunities in processing of these fruits that could be explored:
- Packing units: Orange grading, waxing and packing units have been established in Jhalawar district (the largest orange producer) but more such units will be required in the district as well as in other parts of Kota division.
- Integrated processing plant: Private players could establish processing plants in the division for citrus fruits based on contract farming model. Thus providing marketing security for the farmers

For Example:
- One of the largest beverage manufacturers in the country, has teamed up with the leading micro irrigation company in the country to establish an ultra-modern orange processing plant in Maharashtra
- The facility would have a processing capacity of 500 MT per day and would be spread over 100 acres to manufacture orange juice and orange juice concentrate
- Raw materials would be procured from the local farmers and the beverage manufacturer would guarantee the purchase of all the juice & concentrate manufactured at the facility

- Value-Added Product manufacturing:
  - Orange Puree is prepared from whole fruits and is utilised in the commercial preparation of baked goods, beverages and frozen desserts
  - Orange juice concentrate is widely utilised in the ready-to-drink beverages industry
  - Majority of the orange produced in the division is Nagpur orange. There is scope for introduction of new varieties such as Jaffa oranges and Valencia oranges, which have a higher pulp content and are thus more useful in the processing industry
  - Players establishing processing units as described above, could also utilise the contract farming agreements to produce these varieties
- The CoE for citrus fruits established has already begun introducing these varieties to the farmers but there is plenty of room for
expansion of these varieties to a much larger scale.

- Superior marketing: Given the strength of the division in orange production, opportunity exists for packaging and branding operations of the locally sourced produce and marketing the same as a ‘Made in Rajasthan’ product (as done with RajOlive).

h. Guava

Guava is amongst the key fruits grown in the division. 24% of the guava production of the state in 2015-16 came from the Kota division.

Future Potential

Processing opportunities that exist for this fruit include:

- Packing units: Grading, waxing and packing units for the guava produce could be established in the division
- As in the case of oranges, such units can help improve realisation for the farmer
- Integrated processing plant: Similar to citrus fruits, guava also has widespread usage in industry, especially the beverage industry. Hence, integrated processing plants utilising contract farming of guava, like those suggested for citrus fruits, could also be envisioned
- Output from such units could then further be utilised in the manufacture of value-added products, such as those mentioned below
- Value-Added product manufacturing:
  - Guava pulp is a by-product derived from the fruit and has widespread usage in the preparation of fruit juices, nectars and other beverages
  - Guava can be processed to make other products such as guava jams, jellies and powder etc. that are important from an export perspective as well.

I. Medicinal Plants

Ashwagandha and Isabgol are two important and emerging medicinal plants grown in the Kota division. In 2015-16, ~500 MT of medicinal plants were produced in Kota. Given the favourable growing conditions for these plants and high realisation potential for farmers, there is room for greater promotion of the crops through investments in processing within the division.

- Ashwagandha:
  - It is considered as one of greatest rejuvenating agents in ayurvedic medicine. The leaves are applied externally as a paste or after crushing on inflamed areas and swellings. The leaf extract is also utilised in the preparation of herbal tea, powders, tablets and syrups.
  - Processing units for ayurvedic and unani medicine manufacturing, based on contract farming arrangements with local farmers could be considered.
  - In Pharmacology, Ashwagandha can be utilised in anti-biotics, anti-oxidants, anti-inflammatories, etc.
- Isabgol:
  - Investments in establishing units for making psyllium husk powder could be considered. This is important from an export perspective as well.
  - The plant also has widespread application in medicine manufacturing. It is used in compositions to reduce cholesterol, improve bowel movements and palatability, treating constipation. etc.
  - It is also widely used in manufacture of dietary supplements.

3. Allied sectors

In addition to investments in post-harvest management of crops grown in the division, opportunities for investment also exist in the allied sectors:

Animal Husbandry

a. Dairy production, processing & marketing

The dairy sector has been growing at a rapid pace in the division and has a robust demand considering the large student population in the division (with ~1.5 lac students enrolled at institutes in the division each year).

Investment Potential

Potential investments in the dairy processing operations are:

- Processing and branding:
  - Production of value-added dairy products such as cheese, butter, yoghurt, powder, sauces etc. should be considered.
  - Production and branding of packaged milk to cater to the indigenous population and the growing student population.
  - Manufacturing of other related ingredients such ghee, condensed milk, etc. should also be considered.
  - Along with the above-mentioned, production of buffalo skimmed colostrum powder and whey powder is also an option.
  - Further, investment could be made in improving the cold chain for dairy through setting up more collection points and bulk milk coolers at these collection points.
  - Dairy farmers could also be organised as ‘Producer companies’ or FPOs which would help increase income for the farmers.
  - Branding & marketing of milk procured via these FPOs could also be undertaken to build a recognisable brand.
Additionally, investment opportunity exists for establishment of dairy equipment manufacturers. Processing equipment such as milk testing equipment, electronic milk analyzers, cream separators, milk cans, milking machines etc. would support and promote the establishment of the facilities for producing value added dairy products.

- Farmer Extension Activities (Production):
  - Cross-Breeding of Species: Methods such as cross-breeding to increase milk yield of local low-yielding cattle breed could be adopted.
  - Fertility Camps/ Clinics: Support could be provided via fertility clinics/ camps at the 65 ghoshalas currently in the Kota division (Rajasthan has ~1,200 ghoshalas)
  - Farmer Education: Farmers currently lack awareness of practices such as artificial insemination that are needed to help in breed improvements.
    - Investments could be made in setting up training centers for dairy farmers and farm-hands.

b. Apiculture – Honey Processing

With an ample availability of flora from mustard and coriander, bee-keeping in the region is seeing an upward trend. Every year, 1,400-1,500 new colonies are being introduced into the region.

Investment Potential

There is scope for investments to help grow the practice:

- Processing: Currently, processing capabilities for apiculture products is missing in the division. Every year, 1,400-1,500 new colonies are being introduced into the region and as the practice grows, a number of opportunities in the processing space could be explored:
  - Processing of Raw Honey:
    - Majority of the farmers in the division currently sell honey in raw form to out-of-state processors. Investments could be made in setting-up processing facilities for the raw honey being produced in the area.
    - Locally produced and processed honey could also be packaged and branded in the area and marketed as also recommended local coriander and orange.
  - Value-Added Products:
    - Industrial usages:
      - Bee wax is utilized in the pharmaceutical and
dental industries. It is also used for cosmetics, ointments, candles and household waxes.
- Pollen, rich in protein, is used as a dietary supplement by health food manufacturers.

c. Poultry farming:
Poultry farming is important for increasing farmer income and bringing about rapid economic growth. There has been an increase of 60% in the poultry population of the state over the previous census. ‘Pratap Dhan’ a new breed of poultry developed in Rajasthan produces 4 times the eggs of indigenous breeds.
In the Kota division, poultry farming is still in its nascent stage and as per the 19th livestock census (2012) it had a poultry population of ~2 lac.
In 2015-16, Kota division reported a production of ~325 lac eggs which has grown at a CAGR of ~10% over the last 4 years.

Investment Potential:
New investments can be made for expanding poultry farming practice in the division through contract farming and also using the indigenous varieties. Poultry provides attractive returns to farmers with low investment requirements and also results in increasing farmer income. Increasing youth population and changing consumption habits is expected to result in significant increase in poultry demand in the division.

4. Upcoming sectors:
Kota is situated near the Chambal River and its canal network. The division has a fertile soil and favorable precipitation. These factors open up possibilities for investments in new crop introduction, agro-forestry as well as agri-tourism. In addition, given strong production of various crops, procurement operations based on contract farming agreements with the local farmers should also be explored:

a. New crop introduction:
Quinoa:
Experiments at Agriculture University in Kota have shown that the conditions favour the growth of quinoa in the region. Between 5 and 18 quintals of crop can be produced per hectare and it does not require any special technique for its cultivation. Farmers can also expect a 20% greater realisation for the quinoa crop compared with traditional crops.
Quinoa contains a number of important nutrients including proteins, vitamins and fibre. As a result, quinoa has gained popularity globally as a substitute for traditional cereals like wheat and rice.

Investment Potential:
Cultivation of the crop provides a number investment opportunities including:
- Milling and packaging of quinoa for domestic consumption as well as exports
- Manufacture of quinoa-based foods that are emerging as substitutes for animal-based protein in the Asia-Pacific region

Fruits:
Climatic and soil conditions in the division are conducive for growth of innovative fruit crops such as pomegranate, strawberry and dragon fruit. These high value crops can help improve farmers’ income significantly.

Establishment of grading/sorting and packing units for pomegranate would allow tapping the export market of the crop.
- Pomegranate:
  - Requires substantial technical know-how and has a peculiar irrigation time-table and thus a concerted push would be required from the CoE as well as the government & industry to propagate its growth.
  - Establishment of grading/ sorting and packing units for pomegranate would allow tapping the export market of the crop. India is one of the largest exporters of the fruit and has now begun exporting to large markets like the US as well.
  - Manufacturing of following value-added products could be explored:
    - Juice and other beverages
    - Grenadine (pomegranate syrup) which is utilized in flavoring alcoholic beverages, soft drinks and confections
- Dragon fruit:
  - Conditions favor growth of the fruit and hence its introduction provides an opportunity to tap its growing popularity.
  - Manufacturing units for a wide range of value-added products including jams, jellies, juice etc. could be considered

b. Agro-Forestry:
Agro-forestry is widely seen as an effective program for efficient nutrient cycling, enhancing of organic matter in the soil for sustainable agriculture and for improving tree cover. Given the scale of agricultural operations in Kota division, there is plenty of scope for supplementing agricultural crops with agro-forestry cover.

Investment Potential:
Opportunities in agro-forestry trees/crops, primarily pertain to strengthening of marketing and processing facilities. The key crops along with their future potential have been defined below:
- Henna (Mehndi): The state ranks 1st in production of body grade Henna.
  - There are opportunities in the packaging and processing of henna in the skin care and hair care industries.
- Bamboo: There are opportunities in the following industries:
• Food & Beverages - bamboo vinegar, bamboo wine, bamboo beer
• Pulp & Paper industry - bond paper, cardboard, cement sacks
• Bio-Energy – biofuel, industrial wood, biomass gasification
• Industrial Products – bamboo floor parquet and tiles, chopsticks, crates
• Eucalyptus:
  • The tree is one of the most commonly used sources for pulpwood, to make paper.
  • Eucalyptus oil has huge medicinal benefits and is used in preparing antiseptics, cough drops, decongestants, insect repellents, etc.
• Teak:
  • Teak wood is widely used in manufacturing furniture due to qualities such as durability, easy maintenance and resistance to insects and termites.
• Sheesham (Indian Rosewood/Dalbergia sisso):
  • The wood is an important commercial timber and it has several medicinal benefits: aids in treating ulcers, fevers, sciatica, etc.
• Khejri (Prosopis cineraria):
  • The Khejri tree plays a vital role in agroforestry because of its ability to survive in tough conditions and the different ways in which it can be used by the farmers.
  • Apart from being a source of firewood and fodder, the Khejri also helps in sustaining the nutrient value of the soil and ensuring a good yield.

Given the scale of agricultural operations in Kota division, there is plenty of scope for supplementing agricultural crops with agro-forestry cover.

c. Agri-tourism:
The novel concept of developing farms into vacation ventures is one of the fastest growing concepts in the emerging tourism segment. Many tourists want to experience the everyday life of a farmer or a villager and agri-tourism provides a platform to such tourists. The practice bears a number of benefits for farmers including increased income and infrastructure development in the region to accommodate tourists.

The Kota division provides a variety of opportunities for the promotion of agri-tourism:
a. Forest woodland walks: The farms irrigated via canal and the adjacent forest area could provide host to tourists coming to view the canal network. This would be especially attractive during winter season, when crops such as coriander grow their white flowers and bee-keepers are also in the adjacent forest area with their boxes. Activities could also be organised at these farms for tourists to get hands-on experience in the farm practice.

b. Guided tours of dams and canals: The Chambal river command area covers ~2.29 lac hectares across Kota, Bundi and Baran districts. This area provides a number of opportunities for agri-tourism.

  • River dams: The Chambal River has 4 dams of which two are within 30 km upstream of Kota city. Tourists could be provided guided tours at the dams and shown process of methods canal irrigation methods.
  • Canal Network: The command area has an extensive network of canals to irrigate farmland in the Kota division and tours of these canal networks could also be organized as a part of agri-tourism initiative.

c. Orange orchard trails and Home Stays: Jhalawar district is the leader in orange cultivation with ~96% of the state’s orange production coming from this one district alone. The large-scale orange production provides an opportunity for agri-tourism in the division:

  • Guided tours of the orange orchards where tourists could get involved in farm practices and home stays
  • This would provide the desired hands-on experience for the tourists and allow an avenue for increased income for the farmers of the area.

d. On-farm processing activities: Jhalawar district has also been selected for the development of a CoE for Organic Farming. This COE provides a unique experience to tourists and can help showcase the strength of the region’s agriculture. Tourists could be educated about the various new technologies, seed varieties and practices that are being introduced to the farmers. Products such as jams, jellies, soups, concentrates, etc. made from local produce can also be showcased.

In order to fully tap the potential for agri-tourism in the division, investments will be required in infrastructure development to address concerns that urban travelers might have about staying in a rural setting such as sanitation, hygiene, safety, etc. are also important.
d. Contract Farming
Contract farming encourages private investment and assists farmers in increasing their income through direct marketing of agricultural produce. This not only improves productivity but also improves farmers’ access to markets. Immense potential lies in creating a successful partnership between the farmers and the private players. Key crops where contract farming can be effectively leveraged are:
1. Orange and guava: Integrated processing plants utilizing contract farming output of oranges and guavas could prove to be beneficial for both the farmers and the contracting party.
2. Medicinal plants: Processing units for ayurvedic and unani medicine manufacturing, based on contract farming arrangements with local farmers could be considered.
3. Poultry - Most poultry firms follow a low-risk integration approach of contract farming for poultry farming. Apart from the above, mustard, coriander and other horticulture crops can be considered for contract farming. Additionally, contract farming is gaining importance from an organic farming perspective. Farmers can be made aware of suitable organic farming practices by the contracting party, thereby spreading awareness. Produce from organic farming fetches higher returns to the farmers and the certification process becomes the responsibility of the contracting organisation and thereby reducing the burden on the farmers whilst promoting the cultivation of produce.

e. Procurement centres for organized retail and e-commerce
The agricultural profile of the division substantiated by the high production levels, robust marketing infrastructure and strong connectivity to national and state capitals, provides immense opportunities for organized retailers and e-commerce players to establish procurement centers, pack houses and processing facilities in the region. Setting up these facilities closer to the area of produce results in substantial supply chain efficiencies.
The Rajasthan Government has taken a number of steps and measures to create an enabling environment for businesses. These measures provide exceptions, incentives and subsidies to businesses for a number of operational activities. Some of the initiative include:

a. Rajasthan Agro-Processing and Agri-Marketing Promotion Policy, 2015
   - Endeavors to make Rajasthan the destination of choice for both domestic and global investors
   - Encourages value addition in agricultural produce and reduction of post-harvest losses, thereby increasing the income of the farmers
   - Aims at increasing the export of value-added products from the state
   - Incentives in addition to those under RIPS are also provided through this policy. These include incentives for quality & certification, incentives for research & development, and transport subsidy on export of spices, etc.

b. MSME Policy, 2015
   - Encourages investment in MSMEs and enables a helpful environment for such enterprises
   - Enables streamlining of rules and regulations, provides financial and market support, land allotment and awareness programs
   - Policy also ensures that all fiscal benefits and incentives to MSMEs shall be available as per provisions of the RIPS (2014)

c. Startup Policy, 2015
   - Policy has three major pillars: Student support, student entrepreneur support and incubation support for both fiscal and non-fiscal benefits
   - Key focus areas include social and clean-technology, IoT, mobile and information technology

d. Rajasthan Investment Promotion Scheme (RIPS), 2014
   - Promotes investments made by enterprises in establishing new units, expansion of existing units and investments made in reviving sick units.
   - Agro-processing and agri-marketing are thrust sectors under the scheme and are afforded higher incentives and subsidies including:
     - Investment, Interest and Employment generation subsidy
     - Number of marketing reforms have also been adopted in areas such as contract farming, e-Trading, direct purchase, single licenses for operation throughout the state, establishment of private mandis, among others

e. Rajasthan State Agriculture Policy, 2013
   - Aims to ensure food and nutritional security, farm prosperity and to strengthen agrarian economy
   - Basic goal is to strive for doubling the production of food grains in 10 years and a minimum of 4% agricultural growth every year

These policies, along with other such measures implemented provide a business-friendly environment for investors.

The geographical location of Kota is uniquely favourable and offers strengths and opportunities for development of the agri value chain.

Its agro-climatic conditions, good rainfall, robust irrigation system, high yielding varieties of horticulture and agriculture crops and indigenous milk yielding breeds of cattle offers significant opportunities. The yield of the key crops grown in the division are above the national average yield and hence this division is not only emerging as a leader within the state, but is gaining prominence at a national level.

The division provides investment potential in the following areas:
   - Storage facilities including cold chain infrastructure
   - Establishment of procurement centers for organized retailers
   - Farm machinery manufacturing units and establishment of custom hiring centers
   - Processing of crops like wheat, paddy, coriander, garlic, soybean and orange
   - Dairy processing (milk as well as value added products)
   - Poultry and apiculture
   - Agro-forestry and Agri-tourism

Additionally, the division has an evolved farmer base who are continuously involved in increasing their know how of latest agri techniques and technologies. The presence of agri-research, training institutes and COEs provides opportunities for new crops and yield improvement.

Its strategic location, good infrastructure and well-equipped agro marketing facilities offers ease and convenience from a business standpoint.

The Rajasthan Government is taking keen interest in Kota and are undertaking several efforts in terms of business-friendly policies to create an enabling business environment.

The key sectors of the agri value chain are on a growth trajectory and offer abundant opportunities that would not only significantly benefit the prospective investor but would result in a holistic development of the farmers of the ‘Hadoti’ region.
## Glossary

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>%</td>
<td>Percentage</td>
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<tr>
<td>~</td>
<td>Approximately</td>
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<tr>
<td>Agri</td>
<td>Agriculture</td>
</tr>
<tr>
<td>CAGR</td>
<td>Compound Annual Growth Rate</td>
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<tr>
<td>CoE</td>
<td>Center of Excellence</td>
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<tr>
<td>eNAM</td>
<td>Electronic – National Agriculture Market</td>
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<tr>
<td>FPO</td>
<td>Farmer Producer Organization</td>
</tr>
<tr>
<td>FY’16</td>
<td>Financial Year 2016</td>
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<tr>
<td>GoR</td>
<td>Government of Rajasthan</td>
</tr>
<tr>
<td>Incl</td>
<td>Include/Including</td>
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<tr>
<td>INR</td>
<td>Indian Rupees</td>
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<tr>
<td>IoT</td>
<td>Internet of Things</td>
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<tr>
<td>Kg</td>
<td>Kilograms</td>
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<tr>
<td>km</td>
<td>Kilometres</td>
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<tr>
<td>L</td>
<td>Liters</td>
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<tr>
<td>Mn</td>
<td>Millions</td>
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<tr>
<td>MSME</td>
<td>Micro, Small and Medium Enterprise</td>
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<tr>
<td>MT</td>
<td>Metric Tonnes</td>
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<tr>
<td>MT/ha</td>
<td>Metric Tonnes per Hectare area</td>
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<tr>
<td>NAIS</td>
<td>National Agricultural Insurance Scheme</td>
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<tr>
<td>PGS</td>
<td>Participatory Guarantee Scheme</td>
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<tr>
<td>PKVY</td>
<td>Paramparagat Krishi Vikas Yojna</td>
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<tr>
<td>PMFBY</td>
<td>Pradhan Mantri Fasal Bima Yojna</td>
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<tr>
<td>PMKSY</td>
<td>Pradhan Mantri Krishi Sinchayee Yojna</td>
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<tr>
<td>RCDF</td>
<td>Rajasthan Cooperative Dairy federation</td>
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<tr>
<td>RIPS</td>
<td>Rajasthan Investment Promotion Scheme</td>
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<tr>
<td>SC/ST</td>
<td>Scheduled Caste/ Scheduled Tribe</td>
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<tr>
<td>SME</td>
<td>Small and Medium Enterprise</td>
</tr>
<tr>
<td>TBO</td>
<td>Trade Brand Oil</td>
</tr>
<tr>
<td>WBCIS</td>
<td>Weather Based Crop Insurance Scheme</td>
</tr>
<tr>
<td>mm</td>
<td>Millimetres</td>
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