SCHEME FOR CROP DIVERSIFICATION IN HARYANA  
जल ही जीवन (JAL HI JIVAN)

Context
Haryana is undergoing water stress period wherein depletion of groundwater resources are threatening long-term sustainability of drinking, domestic and irrigation water in the State. Primary cause of decline in water table is practicing of water-hungry crops such as Paddy and Wheat rotation, which is popularly practised in Haryana. Various studies were conducted and suggested that in Haryana the paddy-wheat rotation is unsustainable and is lowering the water table. The increased popularity of these crops may be attributed to remunerative prices for rice and wheat, not only for ensuring food security, but resulted in draining out the excess water brought about due to unlined canals and lack of adequate drainage in the State. Cultivation of these crops over the years has brought significant decline in ground water levels and leading to overexploitation of ground water resources.

As per the estimates of Central Ground Water Board (CGWB) carried out jointly with the State Government reveals that annual replenishable ground water resources in the State is 9130.51 MCM against the withdrawal of 12500.38 MCM, leading to over exploitation of ground water. This indicates that Ground water withdrawal has outpaced its recharge and stage of ground water development of Haryana has reached to 137%. Injudicious withdrawal of ground water has caused depletion of ground water resources and led to decline in water levels in the range of 6 to 76 cm/yr. Out of 128 ground water assessment units of Haryana State, 78 units are over-exploited covering more than 60% of the area. As per the latest assessment of ground water resources of the State out of 128 blocks, 78 blocks are over exploited, 3 blocks are critical, 21 blocks are semi critical and 26 blocks are safe.

NAQUIM Studies carried out by Central Ground Water Board (CGWB)
Observing the water crisis in the State of Haryana, CGWB has taken up National Aquifer Mapping Programme (NAQUIM) in the State with an objective with detailed studies for delineating aquifers, their characterisation, exploring possibilities for enhancing recharge to ground water and suggesting appropriate ground water management strategies for sustainable ground water resources in the State. The Management strategies includes intervention in recharge plans, efficient crop water practices, change in cropping pattern etc. for devising sustainable ground water development and management plans. NAQUIM reports have been presented and shared with concerned State and district authorities for effective implementation. During the presentations, it has been emphasised...
that Paddy Cultivation in Haryana and Punjab is consuming huge amount of ground water and is elucidated in the Graph given below:

District and Block-wise Ground Water Management Plans prepared under NAQUIM studies for Haryana mainly addresses issues of over-exploitation along with other water related issues such as ground water quality, water logging, Artificial recharge to ground water, water intensive agriculture practices etc. One of the strategy suggested in NAQUIM for ground water management plans is to control over exploitation of ground water resources by changing cropping pattern in the State. Shifting from water intensive crop like paddy, sugarcane, etc., to less water consuming crops like Maize, soyabeen, Arhar (Pulses) etc. An estimate have been made indicating water savings that can take place, if cropping pattern is shifted from Paddy-Wheat to Maize/ Soyabeen. Apart from these adoption of Under Ground Pipe Lines (UGPL) for water distribution system instead of open channel and adoption of artificial recharge (AR) to ground water also attribute to water savings. Details are given in Table 1 below:

Table 1: Water Saving methods to be adopted to reduce the present Stage of GW Development (SOD) in Parts of Haryana

<table>
<thead>
<tr>
<th>District</th>
<th>Block</th>
<th>Net Annual Ground Water Availability (MCM)</th>
<th>Present GW Draft (GWR-2013)</th>
<th>SOD</th>
<th>Water Saving Method</th>
<th>Expecte d SOD after Implementatio n</th>
<th>Paddy area to be converted to Maize/ Soyabeen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Karnal</td>
<td>Asandh</td>
<td>8701</td>
<td>21692</td>
<td>249</td>
<td>16.83</td>
<td>2.07</td>
<td>154.9</td>
</tr>
<tr>
<td>Kaithal</td>
<td>Pundri</td>
<td>134.14</td>
<td>307.93</td>
<td>230</td>
<td>6.6</td>
<td>NA</td>
<td>6.6</td>
</tr>
<tr>
<td>Jind</td>
<td>Narwana</td>
<td>223.12</td>
<td>321.32</td>
<td>144</td>
<td>22.09</td>
<td>4.60</td>
<td>20.71</td>
</tr>
<tr>
<td>Kurukshetra</td>
<td>Thaneshwar</td>
<td>149.53</td>
<td>405.5</td>
<td>271</td>
<td>14.98</td>
<td>6.0</td>
<td>235.03</td>
</tr>
<tr>
<td>Ambala</td>
<td>Ambala-I</td>
<td>140.7</td>
<td>113.2</td>
<td>80</td>
<td>6.6</td>
<td>NA</td>
<td>6.6</td>
</tr>
<tr>
<td>Ambala</td>
<td>Saha</td>
<td>74.3</td>
<td>96.5</td>
<td>130</td>
<td>5.7</td>
<td>0.2</td>
<td>16.3</td>
</tr>
<tr>
<td>Yamunanagar</td>
<td>Radour</td>
<td>167</td>
<td>7.36</td>
<td>19.61</td>
<td>0</td>
<td>26.97</td>
<td>14.0</td>
</tr>
<tr>
<td>Sonipat</td>
<td>Gannaur</td>
<td>19778</td>
<td>23711</td>
<td>120</td>
<td>1.76</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Graph: Ground Water Draft Vs Paddy Area Vs Rainfall
While presenting Aquifer Management Strategies evolved during NAQUIM studies and several subsequent meetings held with State Government Authorities, suggested strategies were emphasised and well taken by State Authorities. In front of State Ground Water Coordination Committee, aquifer management plans of all districts were discussed, wherein change in cropping pattern had been considered as one of the most effective water saving strategy for ground water conservation. The conservation of ground water resources by change in cropping pattern were also emphasised upon during Stakeholder training program (Tier-II) and Public Interaction Programmes (PIP) under the NAQUIM Project. Based on the suggestions of CGWB State Government has rolled out a scheme for replacement of Paddy by Maize and other crops in 7 dark zone blocks with a target to diversify around 50000 Hectare area from this season.

**PROPOSED SCHEME**

To save water for our future generations, Department of Agriculture and Farmers Welfare, Haryana launched a new pilot scheme. The scheme is for replacement of Paddy by Maize and other crops in 7 dark zone blocks with a target to diversify around 50000 Hectare area from this season. Due to continuous Paddy growing in the State about 1 m. water table is depleting per year. Crop diversification through the above scheme is intended to promote technological innovation with sustainable agriculture and enable farmers to choose crop alternatives for increasing productivity and income.

Maize was a major crop in the present rice belt of Haryana State during 70s. Moreover, maize used to be food crop but at present ninety percent of its production is used in feed and starch industry in the country and thus it has turned into an industrial crop in India. Looking at these trends, this industrial crop with high yielding seeds and better crop management practices with comparative low cost of production has the potential for replacement of Paddy in the State of Haryana.

In the backdrop of the above, the Haryana Government considered implementation of Pilot Project for change in cropping pattern by a voluntary scheme and support through provision for quality seed, MSP support and other incentives in an area of 50,000 ha spread in eight blocks in as many districts.

**OBJECTIVES OF THE SCHEME**

- To reduce the area of water guzzling crops in Haryana
- Induction of technological innovation for establishing alternate crops for sustainable agriculture.
- To introduce Resource conservation,
- To restore ground water table
To control soil fatigue because of rice-wheat cycle and introduce soil conservative and micronutrients balanced crop for the soil.

To shift the farmer from paddy wheat cycle and give more profitable crop options to the farmers.

PROPOSED DIVERSIFICATION UNDER THIS SCHEME

Scheme envisages diversification of 50000 Hectare area of Non-Basmati area into primarily Maize and other crops. The Pilot is applicable in already identified 8 Blocks in various districts for implementation of Crop Diversification Scheme.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Name of the District</th>
<th>Name of the Block</th>
<th>Average Cultivated Area under Paddy</th>
<th>Target Area under cultivation of Non-Basmati Rice for the adoption of new scheme</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Karnal</td>
<td>Asandh</td>
<td>44500</td>
<td>12000</td>
</tr>
<tr>
<td>2</td>
<td>Kaithal</td>
<td>Pundri</td>
<td>40000</td>
<td>11000</td>
</tr>
<tr>
<td>3</td>
<td>Jind</td>
<td>Narwana</td>
<td>34907</td>
<td>7000</td>
</tr>
<tr>
<td>4</td>
<td>Kurukshetra</td>
<td>Thanesar</td>
<td>18200</td>
<td>7000</td>
</tr>
<tr>
<td>5</td>
<td>Ambala</td>
<td>Ambala-I</td>
<td>25212</td>
<td>6000</td>
</tr>
<tr>
<td>6</td>
<td>Yamunanagar</td>
<td>Radour</td>
<td>14000</td>
<td>2500</td>
</tr>
<tr>
<td>7</td>
<td>Sonipat</td>
<td>Gannaur</td>
<td>18538</td>
<td>2500</td>
</tr>
<tr>
<td>8</td>
<td>Ambala</td>
<td>Saha</td>
<td>6000</td>
<td>2000</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>201357</td>
<td>50000</td>
</tr>
</tbody>
</table>

*Approximate 45% of this area around 87900 Hectare is non-basmati.

The area under diversification will be taken where non-Basmati paddy is in practice of cultivation. Total area under paddy cultivation in these eight blocks is around 201357 Hectare. So, the total area under Non-Basmati rice in these blocks is 87900 Hectare. It is expected that about 50000 Hectare will come under the proposed scheme of diversification.

Some area under the Scheme will be covered under pulses like Pigeonpea (cajanuscajan) commonly known as red gram or turorarharis and arhar, the second most important pulse crop in the country. Such diversification will also bring similar benefits as envisaged under maize diversification.

State Government will ensure purchase of produce of this diversified area through MSP and also give farmer input support and cover his risk by insuring them completely under PMFBY by paying their insurance premium by the State Government with an overall objective of increasing farmers’ income which will step forward in achieving ‘doubling of farmers’ income goal’.

Eligibility Criteria

- Any farmer cultivating rice in these target blocks for at least last 3 years verified by the Girdawari report.
- Register online from 25th May on the portal.
- The Revenue Department shall verify the data of the applicant farmers.
Incentives Provided By The State Government

- Rs 2000/- per acre for the farmer.
- High quality and high yield hybrid seed will be provided to these selected farmers on HSDC counters free of cost.
- The selected farmers will be covered by State Government by paying the farmer’s premium share also for Maize Crop under PMFBY.
- The produce of these farmers will be purchased by the state Government at MSP.

Benefits Under This Scheme

1. Many fold water saving
   - Maize required only 4 Irrigation or less, if rainfall is sufficient as compared to rice which requires 40-45 irrigation in general.
   - Produce of 1 kg of rice requires 2000-5000 litre of water. Water can be saved to the tune of 30 lakh litre/Hectare from nursery raising and puddling per hectare of rice crop.
   - Rice requires 190-220 cm/Hectare (1 cm = 1 lakh litres of water) where as maize requires 60-80 cm/Hectare. Water saving to the tune of 142 cm/Hectare water.

2. Increased wheat yield
   - Maize shall be planted in the end June to 1st week of July, than it can be harvested by all means in mid-October. However, rice harvest takes more time thus maize will help the farmers to plant wheat well in time.
   - By advancing the wheat sowing farmer will get at least 10% higher yield as well as minimizing the risk of terminal heat effect, which is serious concern in rice-wheat belt now a days.

3. Suitable for conservation of agriculture
   - By cultivation of maize its crop residue recycling in zero-till wheat will be easier than rice fallow wheat. Whereas, high amount of rice residue and its non-utilization for fodder purpose along with high silicon content make present zero-till machinery cumbersome for wheat planting.
   - This will improve physical properties of soil and address issues of soil health.
   - Easy in adoption of conservation technology which is resource saving to reduce cost of cultivation and increase the profit margin of the farmers.

4. Less chemical input in maize farming: At least 20% reduction in chemical /pesticides input

5. Green fodder and silage from Maize : To achieve targets under green fodder segment and also provide farmer alternative of animal husbandry.