Benefits and Sustainability of Organic Farming Systems
Promoting Non-chemical Agriculture through Government Programme

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Advisor (Organic)
DA&FW
Organic Agriculture (Definition)

Organic Agriculture is a production system that sustains the health of soils, ecosystems, and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects. Organic Agriculture combines tradition, innovation, and science to benefit the shared environment and promote fair relationships and good quality of life for all involved.

<table>
<thead>
<tr>
<th>Principles of Organic Farming</th>
</tr>
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<tbody>
<tr>
<td>Respect to ecology</td>
</tr>
<tr>
<td>Fairness for all</td>
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</table>

Organic farming does not advocate use of external inputs. It was certification systems that allowed the allowance for use of external organic, biological and mineral inputs as supplementary source to meet the gaps.
Introduction of organic in policy planning and implementation (2005-06)

- Organic agriculture made entry in Govt programme
- NCOF and ICAR-NPOF initiated extension and research
- Organic started with no research and technology
- Organic farmers were taken as torch bearers
- Initial journey was driven by traditional wisdom mastered by our farmers in various parts
- Traditional knowledge in combination with modern science paved the path
- Certification systems provided tool for marketing and export
- Results from research institutions strengthened the confidence
**Solutions adopted for soil and food quality improvements**

<table>
<thead>
<tr>
<th>Mulching and recycling of organic residues</th>
<th>Use of Jivamrit, Bijamrit, Panchgavya, biodynamic solutions, cattle urine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improve soil structure and quality</td>
<td>Use of farm made amino acids from oil cakes/ fish meal</td>
</tr>
<tr>
<td>Water conservation and water use efficiency</td>
<td>Use of minerals and mineral micronutrients in deficient soils</td>
</tr>
<tr>
<td>Adoption of diversified cropping systems, indigenous foods</td>
<td>Inoculating soils for improved Biological Nitrogen Fixation</td>
</tr>
<tr>
<td>Agro-forestry and mixed farming</td>
<td>Microbial processes to increase P-uptake</td>
</tr>
<tr>
<td>No-till or low till agriculture</td>
<td>Botanical and Microbial innovations in plant protection</td>
</tr>
<tr>
<td>On-farm experimentation and adaptation</td>
<td></td>
</tr>
<tr>
<td>On-farm biomass recycling through mulching and composts</td>
<td></td>
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</table>
What was the role of Organic & biological input industry

**Organic Input Industry**
- Composts and vermicomposts were part of INM strategies
- Biopesticides and neem products were part of IPM strategies
- Govt. support helped industry to grow
- India is now producing 722 lakh tons of composts, 2.0 lakh tons of biofertilizers & 1.0 lakh tons of biopesticides
- Many botanicals and bio-stimulants were also launched
- Many of them are certified for use in organic farming

**Who are the users**
- Interestingly 90% of industrial inputs are used by conventional farmers
- Only small quantity used in high value and high risk crops

**What organic farmers use**
- On-farm resources and farm-made livestock-based inputs (Jivamrit, panchgavya, sanjivak etc), composts
- Biodigester extract, biodynamic inputs
- Multi-cropping and rotation with legumes
- Oil cakes, botanicals, neem & karanj oils and soap solutions
How these systems helped and qualified the requirements of Productivity and Profitability

Let us analyze

Maikaal project in MP (FiBL) - Rainfed
- 1,000 farmers, cultivating 3,200 ha
  Yields of cotton, wheat, chili, and soybean were 20 percent higher

Sugarcane in Maharashtra (MPKV) – Irrigated
(142 farmers, 72 Organic and 70 Inorganic)
- Yield less by 6.79 %
- Enhances human labour employment by 16.90%
- Cost of cultivation lower by 14.24 %
- 15.63 per cent higher profits and more stable yields with minimum risk
Yield of crops in four sequence cropping systems under rainfed situations (2009-2014 pooled)

<table>
<thead>
<tr>
<th>Farming systems</th>
<th>Groundnut</th>
<th>Sorghum</th>
<th>Soybean</th>
<th>Durum Wheat</th>
<th>Maize</th>
<th>Chickpea</th>
<th>Cotton</th>
<th>Peas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organic</td>
<td>3789</td>
<td>1220</td>
<td>2602</td>
<td>1127</td>
<td>4611</td>
<td>1098</td>
<td>1428</td>
<td>1778</td>
</tr>
<tr>
<td>Integrated</td>
<td>3587</td>
<td>1194</td>
<td>2311</td>
<td>1038</td>
<td>4486</td>
<td>1013</td>
<td>1383</td>
<td>1712</td>
</tr>
<tr>
<td>RPP</td>
<td>3545</td>
<td>1160</td>
<td>2376</td>
<td>1032</td>
<td>4509</td>
<td>1036</td>
<td>1370</td>
<td>1810</td>
</tr>
<tr>
<td>Inorganic</td>
<td>3018</td>
<td>1002</td>
<td>1804</td>
<td>857</td>
<td>3673</td>
<td>849</td>
<td>1080</td>
<td>1295</td>
</tr>
<tr>
<td>LSD (0.05)</td>
<td>303</td>
<td>92</td>
<td>269</td>
<td>71</td>
<td>306</td>
<td>101</td>
<td>117</td>
<td>191</td>
</tr>
</tbody>
</table>

Source – UAS Dharwad
### Yield (kg/ha) of rabi sorghum and chickpea under different management practices in zone-III (six years pooled data)

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Sorghum Yield (Kg/ha)</th>
<th>Net return (Rs/ha)</th>
<th>Chickpea Yield (Kg/ha)</th>
<th>Net return (Rs/ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fully Organic</td>
<td>1929</td>
<td>23359</td>
<td>1301</td>
<td>23661</td>
</tr>
<tr>
<td>Integrated (50% Org. +50% In-Org.)</td>
<td>1755</td>
<td>21639</td>
<td>1432</td>
<td>25730</td>
</tr>
<tr>
<td>In-organic (RDF)</td>
<td>1463</td>
<td>15635</td>
<td>1202</td>
<td>20879</td>
</tr>
<tr>
<td>RPP (RDF+ Organic Manure)</td>
<td>2017</td>
<td>25818</td>
<td>1370</td>
<td>24983</td>
</tr>
<tr>
<td>LsD(0.0 5)</td>
<td>254</td>
<td>2881</td>
<td>211</td>
<td>3510</td>
</tr>
</tbody>
</table>

Source – UAS Dharwad
## Comparative economic analysis of farming systems (2009-2016 pooled) Net income Rs/ha.

<table>
<thead>
<tr>
<th>Management practices</th>
<th>Groundnut - Sorghum</th>
<th>Maize - Chickpea</th>
<th>Soybean - Durum Wheat</th>
<th>Cotton + peas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organic</td>
<td>116555</td>
<td>58003</td>
<td>62047</td>
<td>72320</td>
</tr>
<tr>
<td>Integrated</td>
<td>111129</td>
<td>56171</td>
<td>54387</td>
<td>69981</td>
</tr>
<tr>
<td>RPP</td>
<td>114849</td>
<td>55714</td>
<td>58207</td>
<td>68905</td>
</tr>
<tr>
<td>Inorganic</td>
<td>96380</td>
<td>44078</td>
<td>44018</td>
<td>49061</td>
</tr>
<tr>
<td>LSD (0.05)</td>
<td>8637</td>
<td>4964</td>
<td>7133</td>
<td>7475</td>
</tr>
</tbody>
</table>

Source – UAS Dharwad
Experiences with Organic Agriculture
(As per the outcome of AI-NPOF of ICAR) Summary

- **Benefits**: Long-term trends of crop yield reveals that organic approach is better than inorganic and is at par with integrated.

- **Net Returns**: Net returns are much better with organic approach than with integrated or inorganic approaches.

- **Benefit-cost ratio**: Benefit-cost ratio is much better with organic approach than with integrated or inorganic approaches.

- **Organic carbon in soil**: Is much better with organic approach (mostly with OF method) than with integrated and inorganic approaches.

- **Soil Microorganisms**: Bacteria, fungi and soil actinomycetes are higher with organic approach than with inorganic approach in 66% cases under study.

There are other studies that suggest that in the case of natural farming, yields may not always be high for all crops, but the benefit-cost ratio is much higher than chemical-based farming along with minimized cost of production.
<table>
<thead>
<tr>
<th>Government Programme and Outcome</th>
<th>During 2005-06 to 2014-15</th>
<th>During 2015-16 to 2021-22</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adoption and certification of organic crops under NHM/MIDH scheme</td>
<td>Paramparagat Krishi Vikas Yojna (PKVY)</td>
<td>6.20 l ha</td>
</tr>
<tr>
<td>5.5 lakh ha</td>
<td>• Namami Gange</td>
<td>1.23 l ha</td>
</tr>
<tr>
<td></td>
<td>• BPKP</td>
<td>4.09 l ha</td>
</tr>
<tr>
<td>Industry/ private players</td>
<td>• Large area certification (LAC)</td>
<td>0.25 l ha</td>
</tr>
<tr>
<td>5.5 lakh ha</td>
<td>Total under PKVY</td>
<td>11.77 l ha</td>
</tr>
<tr>
<td>Mission Organic Value Chain Development for NER</td>
<td></td>
<td>1.55 l ha</td>
</tr>
</tbody>
</table>
## Organic Agriculture in India
(Under certification process – NPOP + PGS)

### Vision
Organic Farming Policy 2005

10% of cultivable land

14 million-advocated

2.8 m Ha – present coverage (around 2%)

Target by 2025
2.5 million Ha additional

### Area

<table>
<thead>
<tr>
<th>Description</th>
<th>Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Area</td>
<td>50.08 lakh Ha</td>
</tr>
<tr>
<td>Cultivated under NPOP + PGS</td>
<td>38.08 lakh Ha (26.57 NPOP +11.51 PGS)</td>
</tr>
<tr>
<td>Wild harvest</td>
<td>12.00 lakh Ha</td>
</tr>
</tbody>
</table>

### Production

<table>
<thead>
<tr>
<th>Description</th>
<th>Production</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under NPOP</td>
<td>32.00 lakh tons</td>
</tr>
<tr>
<td>Under PGS</td>
<td>8.20 lakh tons</td>
</tr>
</tbody>
</table>

### Farmers

<table>
<thead>
<tr>
<th>Description</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>NPOP farmers</td>
<td>13.25 lakh</td>
</tr>
<tr>
<td>PGS farmers</td>
<td>15.47 lakh</td>
</tr>
</tbody>
</table>

### Global Ranking (only NPOP area and farmers)

<table>
<thead>
<tr>
<th>Ranking</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4th</td>
<td>in terms of total area</td>
</tr>
<tr>
<td>1st</td>
<td>in terms of total producers (farmers)</td>
</tr>
</tbody>
</table>
Current Market Status (India as whole)

- Total market size: 11500 crore
- Export share: 7050 crore
- Organized market: 2650 crore
- Farmers markets: 1800 crore

Growth rate exports: 23.35% (CAGR)
- 2016-17: 25%
- 2017-18: 39%
- 2018-19: 49%
- 2019-20: 04%
- 2020-21: 51%

Growth domestic market: 20-28% (CAGR)
# Farmers empowerment through Institutional Development

**Under PKVY**
- 130 FPOs under 10,000 FPO scheme
- 1 federation and 15 FPCs in Maharashtra by state
- 10 FPC in Karnataka by state
- 10 FPCs in UP by state and UP-DASP
- Local brands developed
- Local and organized marketing channels

**Under MOVCDNER**
- 170 FPOs
- Six state brands
- Industry and exporter connect
- Buy-back agreements
- Many FPO having
  - Custom hiring centre
  - Collection & aggregation centre
  - Transport vehicle
  - Minimal processing unit
Entry of Natural Farming

Hon’ble Prime Minister’s call

• There is need to promote natural farming as mass movement;
• Called upon ICAR and KVKs to scientifically experiment and validate
• Called upon farmers to experiment on their field

Budget Announcements

• Chemical-free natural farming will be promoted throughout the country, with a focus on 5 km wide corridors along river Ganga
• States will be encouraged to revise syllabi of agricultural universities to meet the needs of natural, zero budget and organic farming, modern day agriculture, value addition and management
Natural Farming
Basic Foundation

**Definition**

As per NITI Aayog

Natural Farming is a chemical-free alias traditional farming method. It is considered as agroecology based diversified farming system which integrates crops, trees and livestock with functional biodiversity.

**Four Pillars of Natural farming**

- Jivamrita & Ghanjivamrita
- Bijamrita
- Mulching and use of botanicals for plant protection
- Wahpsa

Excludes all purchased inputs (organic or chemicals). Inputs to be formed from Desi cow
Bhartiya Prakratik Krishi Paddhati (BPKP)

- DA&FW decided to include promotion of natural farming under its overall mission for promotion of Non-chemical farming with an aim to reduce cost of cultivation and cut down on use of fertilizers. PKVY was open for any non-chemical form.
- Bhartiya Prakrit Krishi Paddhti (BPKP) was launched as a sub-scheme under PKVY along with the Large area certification targeted to bring default natural farming areas.

Achievements of BPKP

- BPKP launched under PKVY with a provision of Rs. 12,200/ha mainly for manpower deployment, training and continuous handholding plus Rs. 8800/ha for branding, marketing and value addition.
- 8 states adopted the scheme and 4.09 lakh Ha area sanctioned with an out lay of 498.98 crore and first instalment of Rs. 50 crore was released.
- Implementation got delayed due to pandemic.
- Now states have started the implementation and clusters are being developed.
- Recently Uttar Pradesh has also been sanctioned with about 40,000 Ha area to be implemented in Ganga corridor.
Proactive stand of ICAR on R&D and extension

- Constituted a committee for development of course curriculum for UG and PG courses;
- Directed all KVKs to year mark some area for model demonstration farm on natural farming;
- Directed IIFSR Modipuram the coordinating centre on organic farming research to include research on Natural farming;
- Directed all ICAR research institutes and SAUs to start research work on natural farming

Initiatives by DA&FW

- Identified MANAGE for development as "Centre of Excellence on Natural Farming Extension"
- Directed MANAGE to start collecting best practices and course material for creation of pool of champion farmers and natural farming resource persons
- Rs. 1.50 crore already released to MANAGE for awareness creation of all Gram Panchayats through 750 on-line programme. Series already inaugurated by HAM
- DoE gave in-principal approval for launch of National Mission on Natural Farming under RKVY
- Mission Document already prepared and under consultations
National Mission on Natural Farming

Approach

Nation-wide capacity building exercise with focus on continuous training and handholding
Transforming farmer to natural practices willingly on the merit of the system.

Target beneficiaries
(farmers)

More than 15 lakh farmers directly and many more alongside to join the national movement.

Target

- Programme will be implemented in mission mode with mission headquarter at DA&FW
- MANAGE as knowledge repository & centre of excellence on NF
- National Centre of Organic Farming as Certification secretariat
- 60% of KVKs (425 Nos) as model demonstration and training centres
- All blocks will be eligible with institutional structure for promotion
- More than 20,000 rural youth will get engaged for 4 years.
Thank You