The Future of Agriculture in India

Scenario Planning

For guiding the innovation effort
What is likely?

- China and India the “big stories” in the world economy
- More info-intensive world
- Escalating energy (and other commodities) prices to continue
- Escalating water scarcity and cost
- Abrupt climate change
- Economic take-off sustained.
Limits to growth?

- If it takes 60% of total workforce to do what 25% (or less) could do
- Then 65% of the population effectively carries 35% (hidden unemployment)
- Built-in poverty?
- Can economic take-off sustain under these circumstances?
The regulation straitjacket

Productivity; index: best practice = 100

Potential impact of removing regulatory barriers

<table>
<thead>
<tr>
<th>Harmful government regulations</th>
<th>Other factors†</th>
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</thead>
<tbody>
<tr>
<td>61</td>
<td>26</td>
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<tr>
<td>43</td>
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<td>57</td>
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<td>70</td>
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<td>81</td>
<td>19</td>
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<td>87</td>
<td>12</td>
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Source McKinsey
Why is Indian agriculture so heavily regulated?
Landholding size distribution

Size up to in ha

Percentage

1991 census
Average landholdings over time
Agriculture has become relatively stagnant

- Splitting up holdings between one generation and the next has led to farming on the edge of poverty, without slack to absorb disturbances.
- This requires government to continue to step in to smooth out negative shocks to the system (latest example: energy prices).
- This has created a patchwork of controls, regulations and subsidies that are extremely difficult to get rid of.
- The result is a degree of rigidity in agriculture, with 125 million farm families and government locked together in a “self-organizing criticality.”
- Can the scenarios consider options to break out of this?
Manufacturing value added
(real 2000 USD billion)

Source: Shell 2005 scenarios
The key question

- Agricultural diversification
  - Scale of operation (? scale of ownership): is the scale adequate to invest for mechanisation and productivity and to access technology/extension
- The problem can abort India’s economic take-off
- To avoid this happening the Indian agricultural system has to be reformed
- This will require:
  1) Institutional innovation across the value chain
  2) Enabling environment for consolidation of holdings
  3) Creation of new employment for those displaced
- How will this be achieved?
The Four Scenarios

1. **In the valley**
   - India goes it alone.
   - Social progress but economic stagnation
   - Only limited agricultural reform

2. **Along the edge**
   - Free reign of market forces
   - Rich/poor divide
   - Agricultural reform by econ necessity

3. **Over the mountains**
   - Centrally planned economy
   - Freedom reigned in
   - Agricultural reform by compulsion

4. **Through the hills**
   - Focus on investment climate
   - Public/private partnership
   - Enabling of agricultural reform
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**Interventionist**

**Economic management**

**Concern for inclusive growth**

**Liberalized**

**Social texture**
In the Valley, driving forces

Growth

Regulatory intervention

Social provisions

Inequality

External challenges

Desire for cohesion

Call for government intervention
Scenario “In the Valley” in 2030

- Little progress on poverty. Growing unrest by dispossessed.
- Fall-back to tradition, the “Gandhian dream”, resistance to change.
- Swing to the left, call for government/state intervention
- Need to moderate inequality - reduced wealth gap rich/poor
- Need to reduce crime.
- Development of “safety net”
- Taxes high and progressive
- Protection of indigenous economy, India disengages from WTO
- Trade - international (12%), domestic/CSAS (84%)
- GDP-growth rate down to 3 to 4% per annum
- Push towards more effective local government + Panchayats
- Infrastructure - modest growth, focus on maintenance
- Migration - back to villages, rural/urban differential reduced
- Focus on accountability - 50% MPs are women
- Environment management - disaster/ climate/ resource
- Technology follower - limited opportunity/creativity
- Water rationing
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Along the Edge, driving forces

Income levels

Deregulation

Call for government control

Rural unemployment

Alternative employment

Demand

Ability to take risk

Role of the private sector
Scenario “Along the Edge” in 2030

- Market led growth, strong liberalization push
- Regulations “streamlined” in favour of investors
- Social cohesion weakens
- India develops service sector, becomes R&D hub.
- FDI in agriculture introduced
- Farm support gradually phased out
- High economic growth.
- But not enough to provide employment for all, including natural population growth and displacement from agricultural consolidation
- Smaller farmers loose out. Mass sell-out and migration from rural to urban areas, from agriculture to other sectors
- Major poverty issues, social unrest, unemployment, crime rate up, gender relations worsen.
- Average farm size increases – investments, technology access and adoption are high. IT/knowledge extensively used by farmers to reduce transaction costs
- Agricultural exports growing at 20 per cent pa with big and diversified export basket.
- Government down-sizes and withdraws from distributive policies
- Water prices reflect marginal cost of supply
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Concern for inclusive growth

Social texture

Interventionist

Economic management

Reliance on personal incentives

Liberalized
Over the Mountains driving forces

Agricultural growth

Investment levels

Forced consolidation in agriculture

Unemployment

Unrest

Government employment schemes

Power centralization
Scenario “Over the Mountains” in 2030

- Major events instill feeling of crisis
- Swing to the left, demand for government action
- Government intervenes in the economy
- Populist measures to restabilise
- Expanding public sector, community participation reducing
- Government strongly promotes agricultural consolidation on state-by-state basis
- New land reform allows compulsory purchase orders if other measures fail
- Agricultural incomes of the survivors increase due to scale effects
- Constitutional reforms. Water nationalized
- Efficient water management boosts agricultural performance
- Healthy agricultural growth – increased investments and international trade flourishes.
- Government carries responsibility for employment for displaced farmers/labourers. Many employment projects can survive only under government protection
- Inward looking approach - deteriorating climate for private investment
- Bureaucratization kills R&D – ineffective IPR
- Economic growth held back under heavy hand of centralist policies
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  - Economic management
  - Concern for inclusive growth
- Liberalized:
  - Social texture
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Through the hills:
- Focus on investment climate
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- Enabling of agricultural reform
Through the Hills driving forces

- Investments in education and training
- Cheap but skilled labour
- Externally financed infrastructure development
- Agricultural consolidation
- Rural income
- Investments in the RNF sector
- Alternative employment
Scenario “Through the Hills” in 2030

- Investment climate becomes the overriding priority
- Defense expenditure is reduced
- Market led - liberalized, public/private partnership
- Accelerating investments in education and rural infrastructure, building and maintenance. Deficit financing tolerated for productive investments. Private sector involvement through PPR
- Globally integrated – exports/imports high, FDI takes off
- High social cohesion, fostering positive “can-do” spirit
- Democracy – involving the grass-roots
- Attractive employment opportunities tempt small farmer off the land
- Institutional innovations allow dramatic increases in scale and productivity of agricultural production without violating people’s property rights.
- Corporate social responsibility + effective local governance
- Water prices reflect cost but volatility smoothed out by government intervention
The scenarios compared
Scale and landholding

Scale is not the same issue as landholding. It is scale that drives investments, unit cost and productivity. The issue is “taking people off the land by development of alternative employment”.

- **Valley**: small holdings continue as now. Some development through upgrading to higher value products, but relatively small.
- **Edge**: privately held holdings increase in size under market forces. Poor are have no alternative but to sell
- **Mountains**: enforced consolidation, if necessary by compulsory purchase of small holdings
- **Hills**: small landowners move to attractive alternative employment, scale achieved primarily through renting out to large farms and contract farming firms (reverse tenancy)
Water management

- **Valley**: muddling through, decentralized (catch the rain where it falls)
- **Edge**: decentralized, privately owned supply/storage systems
- **Mountains**: large-scale publicly owned supply/storage systems
- **Hills**: storage systems in public/private partnership
## Comparative Statistics of the Four Scenarios - 2030

<table>
<thead>
<tr>
<th>Main indicators</th>
<th>2004-base</th>
<th>In the Valley</th>
<th>Through the Hills</th>
<th>Along the Edge</th>
<th>Over the Mountains</th>
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<tbody>
<tr>
<td>Population (m)</td>
<td>1080</td>
<td>1300</td>
<td>1470</td>
<td>1350</td>
<td>1470</td>
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<tr>
<td>Ppl rural areas(%)</td>
<td>71</td>
<td>66</td>
<td>38</td>
<td>26</td>
<td>45</td>
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<tr>
<td>Poverty (%)</td>
<td>26</td>
<td>11</td>
<td>14</td>
<td>19</td>
<td>16</td>
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<tr>
<td>Income p.c.(US $)</td>
<td>620</td>
<td>1400</td>
<td>3600</td>
<td>4200</td>
<td>2900</td>
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<tr>
<td>F.WaterAvl(km$^3$/yr)</td>
<td>1280</td>
<td>1000</td>
<td>1280</td>
<td>1280</td>
<td>1320</td>
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<tr>
<td>Agrl./ GDP (%)</td>
<td>21</td>
<td>21</td>
<td>11</td>
<td>10</td>
<td>15</td>
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<tr>
<td>Avg.farm size(ha.)</td>
<td>1.4</td>
<td>2</td>
<td>12</td>
<td>20</td>
<td>18</td>
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<tr>
<td>MainAgrl.Lbor(%)</td>
<td>65</td>
<td>55</td>
<td>30</td>
<td>20</td>
<td>25</td>
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<tr>
<td>FDI (US $ b./yr)</td>
<td>4</td>
<td>10</td>
<td>80</td>
<td>100</td>
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