Technological Challenges and Role of Agricultural Universities in Mitigating the Effect of Climate Change in Hilly Regions

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• **Geographically Hill and Mountainous region of Indian Himalayan**

  – Spread over 12 states

  – Covering total land area of 61.5 m. Ha.

  – Half of the area (33 m.ha) lies in the North Western Himalayan region
INDIAN NW HIMALAYA COMPRISES

- Jammu & Kashmir
- Himachal Pradesh
- Uttarakhand
The Region has Unique Characteristics

• Undulating Topography with Highlands
• Mountain ranges,
• Rivers, Rivulets, Valleys
• Where
• Inaccessibility
• Fragility
• Marginality
• Are the Hallmark of Unsustainable Agriculture
Unsustainable Because of

- Small fragmented and scattered land holdings = 9.60 lakh
  Av. Size 1.04 ha)

- Stagnant productivity of traditional crops = ~ 1.5 t/ha

- Rain dependent agriculture = 81 %

- Less use of Recommended Inputs = ~ 50 %

- Lack of Farm Mechanization = Power operated implements not popular

- Diverse Agro climates

- Data, Hill state HP
Climate

There is a huge variation in the climatic conditions of Himachal Pradesh due to variation in altitude (450–6500 mts). The climate varies from hot and sub-humid tropical (450–900 metres) in the southern low tracts, warm and temperate (900–1800 mts), cool and temperate (1900–2400 mts) and cold glacial and alpine (2400–4800 mts) in the northern and eastern high elevated mountain ranges.
<table>
<thead>
<tr>
<th>Zones</th>
<th>Climate Altitude (m amsl)</th>
<th>Livelihood production system</th>
<th>Himachal Pradesh</th>
<th>Jammu &amp; Kashmir</th>
<th>Uttarakhand</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Zone I</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subordinate and low hills</td>
<td>Sub-tropical 200-800</td>
<td>Agri- Livestock Fish-Horticulture</td>
<td>Una,Bilaspur,Hamirpur, And parts of Sirmaur,Kangra Solan and Chamba district</td>
<td>Jammu and plains of Udhampur district</td>
<td>Parts of Pauri Garhwal,Dehradun, Almora and Pithoragarh districts</td>
</tr>
<tr>
<td><strong>Zone II</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mid-Hills</td>
<td>Sub-humid 801-1800</td>
<td>Agri-horti- Livestock- fishery</td>
<td>Tehsils of Palampur and Kangra of Kangra District, Rampur tehsil of Shimla District and parts of Mandi, Solan, Kullu,Chamba,Sirmaur and Shimla Districts</td>
<td>Hilly areas of Doda,Udhampur Rajauri,and Punch districts</td>
<td>Parts of all districts</td>
</tr>
<tr>
<td><strong>Zone III</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High hills</td>
<td>Temperate 1801-2200</td>
<td>Hort. Livestock- pasture-agriculture- fishery</td>
<td>Shimla district(except Rampur tehsil)and parts of Kuulu,Solan,Chamba,M andi,Kangra and Sirmaur districts</td>
<td>Srinagar, Budgam,Anantnag,p ulwama,Baramula, and Kupwara,districts</td>
<td>Major part of , Pithoragarh, Uttarkashi and small part of Chamoli and Tehri Garhwal</td>
</tr>
<tr>
<td><strong>Zone IV</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very high hills</td>
<td>Dry Temperate - Alpine, &gt;2200</td>
<td>Livestock-silvipasture-agriculture- hort.</td>
<td>Kinnaur,Lahaul and Spiti,and pangi and Bharmour tehsils of Chamba district</td>
<td>Leh and Kargil districts</td>
<td>Parts of Uttarkashi, Chamoli, Pithoragarh and Almora districts</td>
</tr>
</tbody>
</table>
ECONOMY OF PEOPLE IS BASED ON

- **Agriculture**: 45% contributions to SDP
  > 93% of 71.25 lakh popn dependent
  71% get direct employment

- **Livestock**: 52.16 lakh popn, Integral part of farming

- **Horticulture**: Apple Principal crop
  Economy Rs 3500 crores

- **But, the income of all resources is hardly enough to meet the requirement of livelihoods of people**
Agricultural Scenario of Himachal Pradesh

• Population = 71.25 lakhs
• Rural based = 17,495 villages
• Live stock = 52.17 lakh
  • Cattle = 22.69 lakh
  • Indigenous = 55% (as per 2012 census)
  • Daily Milk yield = 3.3 liters

• The dominant features:
  • Hill farming
  • Total area = 55.67 lakh ha.
  • Net sown area = 5.40 lakh ha.
  • Total cropped area = 9.46 lakh ha.
  • Net Irrigated = 1.08 lakh ha.
Agricultural Scenario - contd

• Small/scattered land holdings = 87.4 %
• Av size = 1.04 ha
• Rainfed = ~ 81 %

• Per capita Income = Rs 1.05 lakh
  (- 2011 Census)

• State domestic product (SDP) = 15 % (2013-14)
• Declined from = 57.9 % (1950-51)

• Agriculture work force = ~ 70 % of the total
### Agricultural Scenario – Crop-wise

<table>
<thead>
<tr>
<th>Crop</th>
<th>Area (lakh. ha)</th>
<th>Prod.(t./ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat</td>
<td>3.8</td>
<td>1.5</td>
</tr>
<tr>
<td>Maize</td>
<td>3.0</td>
<td>2.3</td>
</tr>
<tr>
<td>Rice</td>
<td>0.76</td>
<td>1.5</td>
</tr>
<tr>
<td>Barley</td>
<td>0.23</td>
<td>0.9</td>
</tr>
<tr>
<td>Millets</td>
<td>0.09</td>
<td>0.5</td>
</tr>
<tr>
<td>&amp; other cereals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ragi</td>
<td>0.013</td>
<td>2.0</td>
</tr>
<tr>
<td>Pulses</td>
<td>0.30</td>
<td>0.8</td>
</tr>
<tr>
<td>Total</td>
<td>9.46</td>
<td>1.5</td>
</tr>
<tr>
<td>Vegetables</td>
<td>0.80</td>
<td>~ 20</td>
</tr>
<tr>
<td>Oilseeds</td>
<td>0.49</td>
<td>&lt; 0.4</td>
</tr>
</tbody>
</table>

- Data: 2013-14 except a few crops
Food Grain, Vegetable and Milk Production in the State

Production (tonnes)

Year

Total vegetables  Total milk  Total foodgrains
## Research Achievements

### Improved varieties/hybrids released

<table>
<thead>
<tr>
<th>Crop</th>
<th>No. of varieties/hybrids</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maize</td>
<td>10</td>
</tr>
<tr>
<td>Rice</td>
<td>23</td>
</tr>
<tr>
<td>Wheat</td>
<td>26</td>
</tr>
<tr>
<td>Barley</td>
<td>6</td>
</tr>
<tr>
<td>Buckwheat</td>
<td>2</td>
</tr>
<tr>
<td>Pulses</td>
<td>23</td>
</tr>
<tr>
<td>Oilseeds</td>
<td>23</td>
</tr>
<tr>
<td>Vegetable crops</td>
<td>27</td>
</tr>
<tr>
<td>Fodder</td>
<td>12</td>
</tr>
<tr>
<td>Tea</td>
<td>2</td>
</tr>
<tr>
<td><strong>Sugarcane</strong></td>
<td><strong>1</strong></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>155</strong></td>
</tr>
</tbody>
</table>
Other Technological Recommendations

• About **100 technological recommendations** have been made on different aspects of agriculture and allied sectors

• Developed 13 Agricultural Tools to reduce Drudgery in Hill Farming
Climate Change and New Challenges Predicted

- Climate has shown warming of 0.89 [0.69 to 1.08] °C over the period 1901–2012 which is mainly attributed to anthropogenic activities (IPCC 2013)
- Water: surface flow and ground water and flow of Nallahs, rivers etc was declining more or less due to higher temperature during summer and less rainfall as well as less snowfall during winter.
- Shift in Crop season
- Alternate crops to respond better to climate change
- Threats of new diseases and pests and new races of existing ones & their management
Climate change trends for 1951-2010 in North Western Himalayas

Annual Mean Max Temp Trends for 1951-2010

deg C/year
- Decreasing
- Decreasing significantly at 95%
- Increasing
- Increasing significantly at 95%
No trend

Annual Mean Min Temp Trends for 1951-2010

deg C/year
- Decreasing
- Decreasing significantly at 95%
- Increasing
- Increasing significantly at 95%
No trend

Annual Mean DTR Trends for 1951-2010

deg C/year
- Decreasing
- Decreasing significantly at 95%
- Increasing
- Increasing significantly at 95%
No trend

Annual R/F trends for 1951-2010

mm/year
- Decreasing
- Decreasing significantly at 95%
- Increasing
- Increasing significantly at 95%
No trend

(Rathore et al, 2013)
Some of the values indicate that Himalayas are warming 5-6 times more than the global average compared to plain areas.

Mean temperature change is $+0.02^\circ C/\text{year}$, diurnal temp. $+0.06^\circ C/\text{year}$, rainfall $-3.26$ mm/year, Increase in summer rainfall & Temp. The minimum temperature trends are inconsistent.

The data available on temperature in Himalayas and down stream indicate that warming during last 3-4 decades has been more than the global average of 0.75% over last century.
Climate change is likely to impact food security of the world by 2020.
Climate change is likely to impact food security of the world by 2050.
Climate change scenario in Himachal Pradesh
• In sub temperate region
  – During the period from 2001-2011 maximum temperature increased in all the seasons, with highest increase of 3.11°C in winter months from the base years of 1971-90 which was followed by 1.57°C increase in spring season
  – In the region, the decade 2001-2011 experienced decrease in the rainfall during summer, spring and winter seasons
• In wet temperate region
  – Maximum temperature increased in all the seasons during the period 1991-2000 and 2001-2011 compared over the baseline 1971-1990
  – Among both the decades highest increase of 3.98°C in maximum temperature was recorded during the period from 2001-2011 in winter season
  – The total rainfall was found to decrease during summer and spring months of both the decades
Snowfall pattern of wet temperate region of North-Western Himalaya
Climate Change Impact in Western Himalaya

- **1975-2013 (38 yrs)** in the month from Dec to Feb
  No. of cold nights decreased & warm increased

- **1964-2010 (46 yrs)** Annual Rainfall
  Increased upto 1986 for 22 yrs & thereafter started decreasing

- **1964 to 2000 (36 yrs)**
  16 Drought occurred (5 of these severe)

- **2000-2010 (10 yrs)**
  7 droughts (3 severe)
Different scenarios of Biotic & Abiotic stresses

Rice: Heavy incidence of BPH for the 1\textsuperscript{st} time in some rice growing areas of UK in 2010.

Wheat: High severity of yellow rust during late Feb-Mid March in 2011
1 °C rise in temp will end up 3-4 % reduction in yield.

In Kharif crops: Drought stress is observed in initial stage & cold at grain filling

In Rabi crops: Low rainfall caused significant reduction yield.
Farmers’ Perceptions about Climate Change in HP

• The farmers perceived increasing temperature during summers, prolonged summers
• Delayed onset of SW monsoon, uneven distribution of rains and unpredictable rainfalls
• Delayed onset of winter, short winter periods, temperature above normal during winters
• Decreasing snowfall during winters, delayed snowfall, low temperature spell in high altitude during winters
Himachal scenario of climate change

- In All Zones
  - **Temperature**: Increasing
- Zone I, II and III
  - **Rainfall and Frost**: Decreasing
- Zone IV
  - **Rainfall**: Increasing
  - **Snowfall**: Decreasing

Causing more landslides due to loose strata

(International Journal of Farm Sciences 2(2) :95-101, 2012)
Biological Indicators for Climate Change

- **Zone II**: For early sown wheat
  - The reproductive phase shortened by = 5 days
    - Maturity = 15 days
  - Rice vars Himdhan -1 & K 39
    - Reproductive phase reduced by = 1 to 10 days
- **Zone III**: Kullu valley
  - Barley
    - Reproductive and maturity phases enhanced by 10 to 26 days
Land use and crop productivity

- In general in zone I, II and III
  Sowing and harvesting time of crops was delayed by 15 to 30 days depending upon the rainfall.

- In Zone IV
  Its preponed by ~ 15 days

- Productivity of field crops was hampered due to high incidences of diseases in field crops.

- For Ex. Potato due to scarcity of irrigation water farmers had to shift to tomato and other Chinese vegetables.
Cultivation of traditional crops

- Cereals like Koda, Phafra, Kawani, red rice etc was negligible or very less as people were interested in growing more cash crops.

- The apple growing belt in low lying valley areas like Kullu once considered good for apple production is now has become extremely marginal therefore shifting trend.
For Diversification

• With other fruits like kiwi and pomegranate and vegetable seed production

• The snow (white manure of apple) line now shifted upward to higher hills.

• Quality apple production has shifted to higher hills and dry temperate zones of Kinnaur and Spiti areas (Gautam 2011).

• In mid hill zone apple growing belt has been replaced with stone fruits because of less precipitation as this area has shown no snowfall for the last 8-10 years.
Change in Phonological Pattern

• Mango and citrus trees of low hills are drying due to more frost in winter.

• Temperate tree species are also moving to higher elevation and their sites were being taken by the tropical and subtropical tree species.

• Quality of fruits is also hampered: size reduced, fruits ripe before the maturity resulting in improper fruit colour.
Effect on fruit crops cultivation

Increase in temperature

Reduction in rainfall and snowfall

Severely affected the APPLE CROP in foot hills
Area under apple in HP (‘000ha)

<table>
<thead>
<tr>
<th>Year</th>
<th>Area (‘000ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000-01</td>
<td>90.347</td>
</tr>
<tr>
<td>2002-03</td>
<td>92.82</td>
</tr>
<tr>
<td>2004-05</td>
<td>81.63</td>
</tr>
<tr>
<td>2006-07</td>
<td>84.112</td>
</tr>
<tr>
<td>2008-09</td>
<td>86.202</td>
</tr>
<tr>
<td>2010-11</td>
<td>88.56</td>
</tr>
<tr>
<td>2010-11</td>
<td>91.804</td>
</tr>
<tr>
<td>2010-11</td>
<td>94.726</td>
</tr>
<tr>
<td>2010-11</td>
<td>97.438</td>
</tr>
<tr>
<td>2010-11</td>
<td>99.564</td>
</tr>
<tr>
<td>2010-11</td>
<td>101.485</td>
</tr>
<tr>
<td>2010-11</td>
<td>103.644</td>
</tr>
</tbody>
</table>
New areas are coming up for apple & areas lost are being used for vegetable and other fruit crops in HP.
Challenges in Floriculture

• Temperatures fluctuation reduce flower size in Jasmine

• Commercial production of flowers particularly grown under open field conditions will be severely affected leading to poor flowering, improper floral development and colour
Challenges in Spice Crops

- The increase in max. and min. day temp. and decreasing the annual rainfall reflected in the productivity decreasing trend in Kashmir’s prized saffron crop.

- Saffron has suffered a 40% drop in production. Some of the saffron farmers who traditionally relied on rainwater are now looking at irrigation measures to save their rare and labour intensive crop.
The surplus water balance clearly showed decreasing trends in all the agro climatic zones of H.P during past three decades.

Maximum availability of surplus water balance period showed a shift during July to August and registered a decrease of 35.7 percent.

The trends revealed significant decrease of surface water flow of major rivers during all the months.

Snowfall showed clear trend of decrease in past two-three decades and shrinking winters.
Climate change challenges and pest & diseases incidences

- Shift in the geographical distribution
- Changes in the physiology of host
- Changes in the rate of development
- More rapid development
- Increased transmission and dispersal
- More virulent forms
- Vulnerability of present day host cultivars

Yellow Stem Borer trapped in pheromone trap at Dhaulakuan during 2012

Asian soybean rust.... Appearing as a new disease
Role of Agricultural Universities in mitigating the effect of climate change
Adaptations for situation under climate change

- Breeding varieties as an adaptation strategy
- Change in planting date as an adaptation strategy
- Change in management practices
- For Enhancing productivity and production of Hill crops
  - Matching with all India average under irrigated prodn system
  - Doubling under rainfed
  - Value addition / Biofortification of rainfed crops

- Diversification for high value cash crops

- Zero budgeting agriculture / Organic Farming
Genetic enhancement approaches to develop climate resilient crops

Traits

• Increasing the yield
• Increasing the resource use efficiency – radiation, water & nutrient
• Increasing the yield stability – tolerance to stresses

Approaches

Ø Genetic variation: Natural variations - Germplasm resources, Induced variations - Mutant resources
Ø Genomics assisted Breeding
Simulated Adaptations for different crops of HP

**Maize:** The best simulated planting date for maize appeared 20th June under increased temperature of 1 and 2 °C and delayed sowing showed more impact of increased temperature.

**Mustard:** The simulated planting windows for mustard appeared 9th November based on 20 years simulation under increased temperature and 1 to 3 irrigations at Palampur.

**Gobhi Sarson:** The simulated planting windows for *Gobhi Sarson* appeared November, 9 and the yield was 50 kg /ha higher when crop was sown during 1-10 November, 2011 compared to crops sown during October 20-31 October.

**Soybean:** Delay of planting window by 10 days seems best adaptation measure.

**Wheat:** Changes of sowing window in normal and late sown crop showed mitigation impacts. Two to four irrigations under rainfed conditions showed increase in yield at higher temperature scenarios.
Mitigation options for GHG emission from agricultural soils

- Conservation agriculture
- Conservation/restoration of degraded soils
- Drip, furrow or sub-surface irrigation
- Cover crop, crop rotations, diversification
- Judicious use of off-farm input
- Integrating trees and livestock with crop
Adoption of soil moisture conservation techniques

Laser land leveling

Raised bed planting

Mulching
New developments such as MICRO IRRIGATION have added new dimensions to the commercial agriculture in the state

Govt of HP 7th Plan Period
River wealth of Himachal Pradesh

Rivers: 5 of the Nation’s originate in Himachal

Irrigating land ~ 100% in Punjab, Haryana, Raj, even across International border in PAKISTAN.

The Beas
– Rises near Rohtang Pass and flows some 256km in Himachal with catchment area of ~12,560 sq. km.

The Chandrabhaga or Chenab
– It flows 122kms and has a catchments area of 7500sq.km. before entering Kashmir.

The Ravi
– Born in Bara Banghal, Kangra and has a length of about 158km with catchment area of about 5451km.

The Sutlej
– The catchment area of Sutlej in Himachal is 20,000sq.km.

The Yamuna
– Its total catchment area in Himachal is 2320sq.km.
Lakes and water reservoirs in HP

- Most important lakes and water reservoirs representing the water budget in HP are 21 and having an area of about 218918.5 ha

Pong Dam
- In district Kangra
- Area = 21712 Ha.

Renuka Wetland
- In district Sirmaur
- Area = 15 ha.

Pong Dam
- In district Lahaul & Spiti
- Area = 49 ha.
Despite Water resources of Himachal Hills

- State has only 19% area under assured irrigation

- Hence, the State and centre govts must initiate efforts to utilise available water to irrigate total cultivated area of 5.46 lakh ha.

- In assured irrigated land crop diversification is picking up
An Engineering Marvel..... Bypass shoot of Beas-Sutlej Link project opened only for 15 minutes. Rare event could be seen only once in a year. Don’t miss SEEING, the power of WATER.
Crop Diversification

Apple cultivation in L & S and Kinnaur

Pomegranate cultivation in Kullu

Vegetable seed production in Kullu
Area under vegetable crops in HP ('000ha)

![Bar chart showing area under vegetable crops in HP from 2005-06 to 2013-14]

- 2005-06: 49.8
- 2006-07: 52
- 2007-08: 55.7
- 2008-09: 58.7
- 2009-10: 63.8
- 2010-11: 65
- 2011-12: 67.9
- 2012-13: 68.8
- 2013-14: 72.0
Cultivation of Exotic Vegetables

- Asparagus, broccoli, lettuce, coloured capsicum, celery, Chinese cabbage, Brussels sprouts, European carrot, parsley, leek etc.

- During 2010-11, offshore vegetables were grown in 7,511 hectares of tribal districts of Lahaul-Spiti and Kinnaur

- Lahaul-Spiti district is leading with offshore vegetable cultivation in 4,128 hectares, while 3,383 hectares were cultivated with offshore vegetables in Kinnaur district.
Changing cropping pattern towards vegetables in particular of exotic vegetables in Lahaul valley
Protected Cultivation

• Protected cultivation is future because Land and Water – Nature’s gift to mankind is not unlimited and free forever.

• Its has resulted in enhancing cropping season by 3 months in Tribal snow bound area of L& S.

• Now Farmers are harvesting Two crops in place of one.
Economics of major crops under protected cultivation (Rs. /100m²)

<table>
<thead>
<tr>
<th>Crop</th>
<th>Economics (Rs. /100m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tomato</td>
<td>2485</td>
</tr>
<tr>
<td>Capsicum green</td>
<td>9487</td>
</tr>
<tr>
<td>Capsicum coloured</td>
<td>8744</td>
</tr>
</tbody>
</table>
Mushroom Cultivation

- The climate of all districts in Himachal Pradesh is suitable to take minimum 2 crops of button mushroom
- Button mushroom cultivation provides 100-120% net profit in three months cropping cycle.
- Two cropping cycle of 1000 Kg/annum compost under suitable conditions of temperature (18-22°C) can yield net profit of Rs. 15000-18000 in three months time.
• HP could be by default an Organic state

• Consumption of Fertilizers in terms of Nutrients (N+P+K)
  • Kharif = 213.32 lakh tons
  • Rabi = 301.51 lakh tons
• Total = 514.83 lakh kg
• Consumption ratio = 1:54 to 1:95 Kg (based on net sown area)
• As Against in plains = 1: 350 - 500 Kg

• Organic Nutrients
• Required for replacement = 54 - 95 kg/ha.
Organic Agriculture

• Nitch area of excellence since 2006 and Department of organic agriculture established since 2009

• A number of technologies developed

• ~ 39000 farmers covering an area of 19000 ha have adopted organic

• Assuming 10% of the total cropped area of the state (94059.7 ha) is projected to convert into organic farming by 2020, which can mitigate a total of 9855.61 ton CO₂ equivalent (104.78 kg Carbon Equivalent CO₂/ha) annually.
Education and awareness programmes

• Since 2008, this University is spreading awareness amongst farmers and students by carrying out 2 to 3 programmes per year on the Climate Change and Earth Days

District level contingent crop plans

• District level contingent crop plans for eight districts viz., Hamirpur, Bilaspur, Una, Kangra, Kullu, Sirmaur, Mandi and Lahaul & Spiti of Himachal Pradesh have been prepared
Weather Forecasting and Network Projects on Climate Change

- Medium range weather forecast, currently available for all the districts in the state, is immensely useful for farm decision making by the farmers

National Innovation on Climate Resilient Agriculture

- Under this project, best Climate Resilient Agricultural Technologies are being demonstrated at *Krishi Vigyan Kendras* and the farmers of the villages around KVKs are being advised to utilize/adopt the weather based agricultural management strategies being developed by the University
Weather based Advisories survey in H.P.

1189 farmers surveyed in 9 districts of HP
Majority of the farmers surveyed reported that based on advisories issued maximum 1 irrigations, 1 pesticide spray and 10-12 kg fertilizers saving ; 1 to 1.5 kg increase in milk yield during summers can be saved.

One irrigation and one spray and 12 kg fertilizers can save more than 100 kg CO₂ Eq.
GIS & RS based Climate Change management - A step toward Digital India

Scalable Spatial Theme developed by CSKHPKV for Climate and Agriculture Management
GIS & RS based Climate Change management - A step toward Digital India

Scalable Spatial Theme developed by CSKHPKV for Climate and Agriculture Management
• Conclusions

• In India as well as in hills of North-Western Indian Himalayas the agriculture farming has made significant strides in the last three decades.

• But success for future depends on how we respond to adjust all forms of agriculture to better adapt to changing climate
sustainable Hills
Better Future

Its Dev Bhumi
Himachal

Thank You