

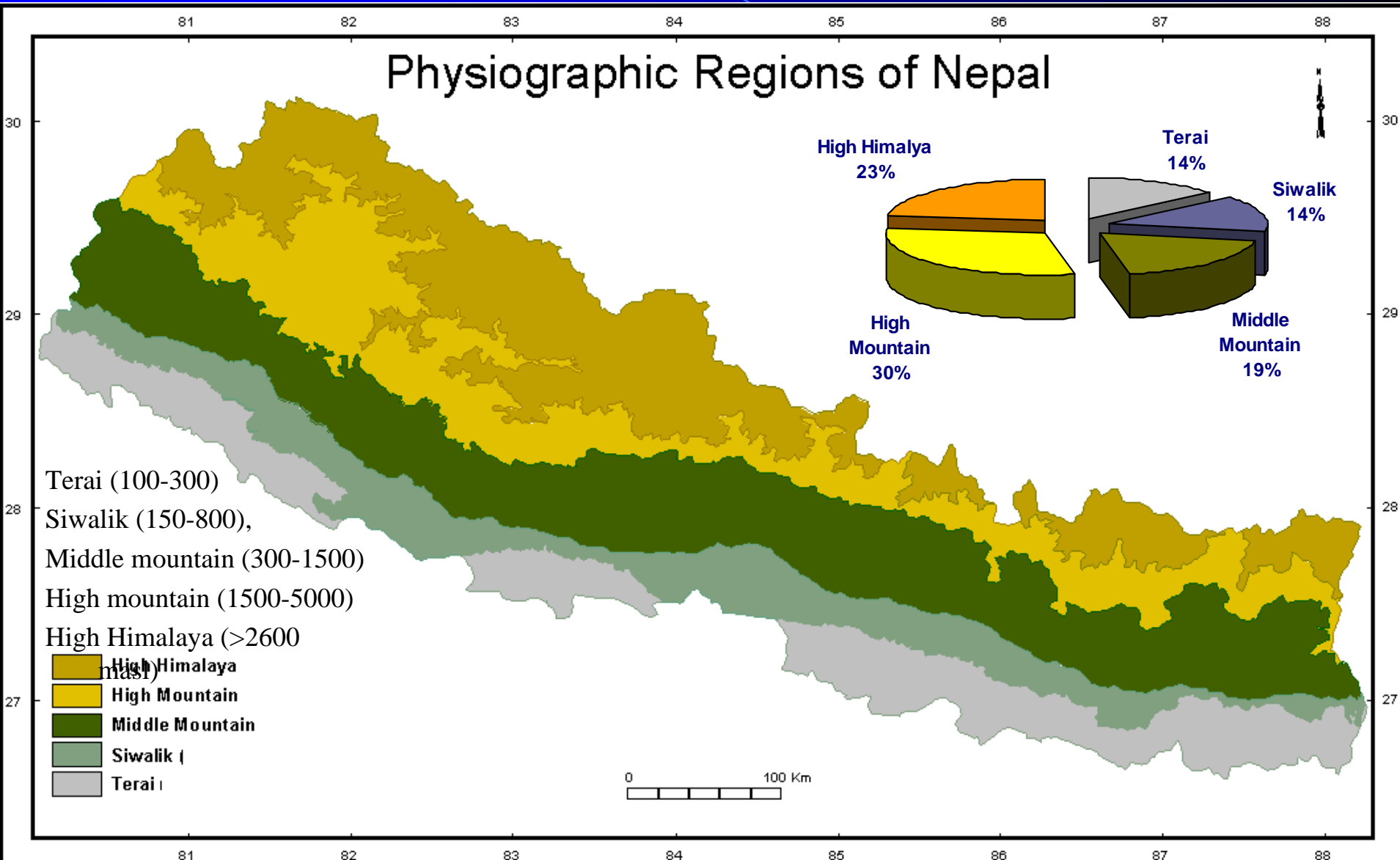
Status of agricultural mechanization, food chain management and Agro based enterprise development in Nepal

G B Manandhar

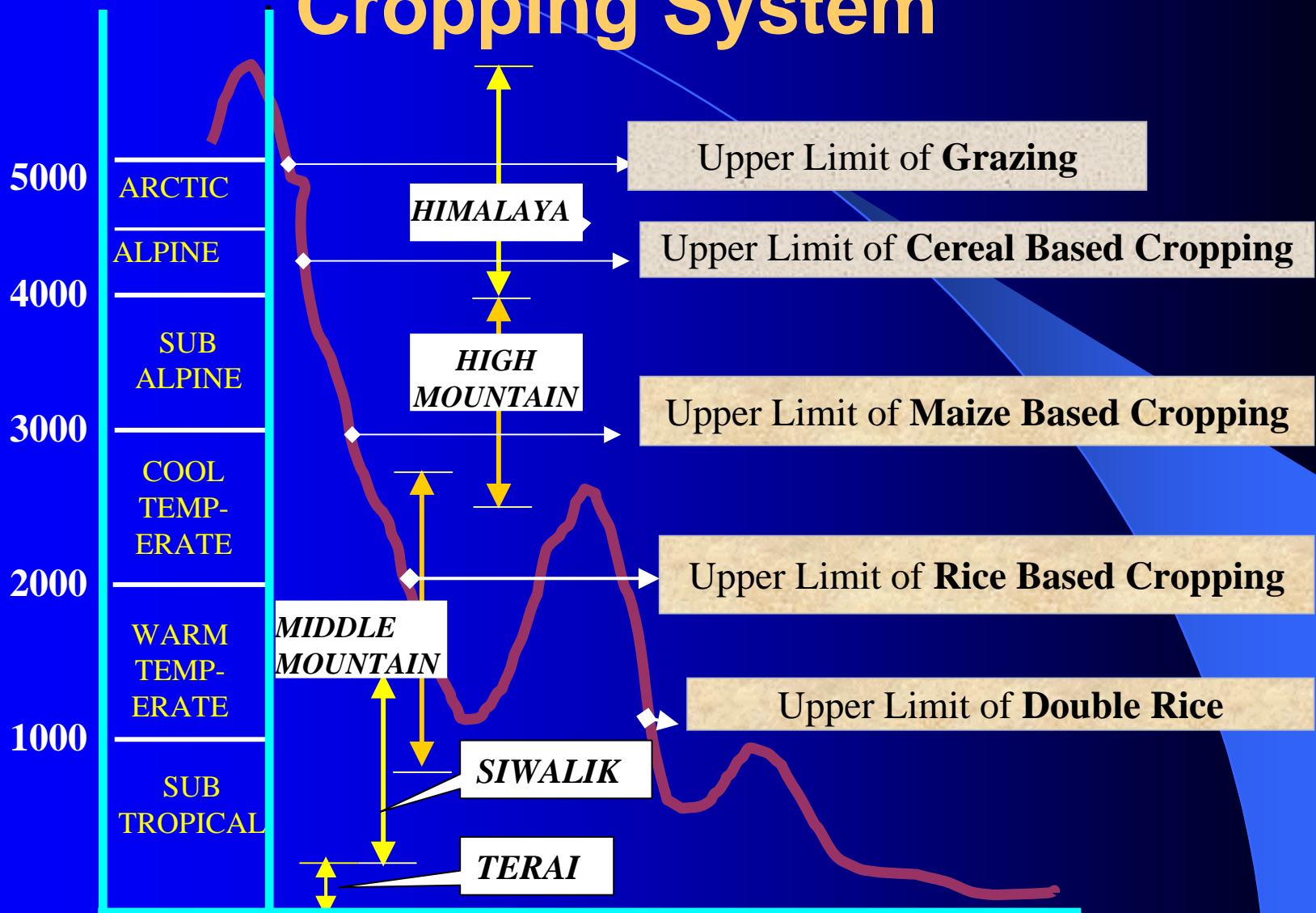
Chief, Agricultural Engineering Division

NARC

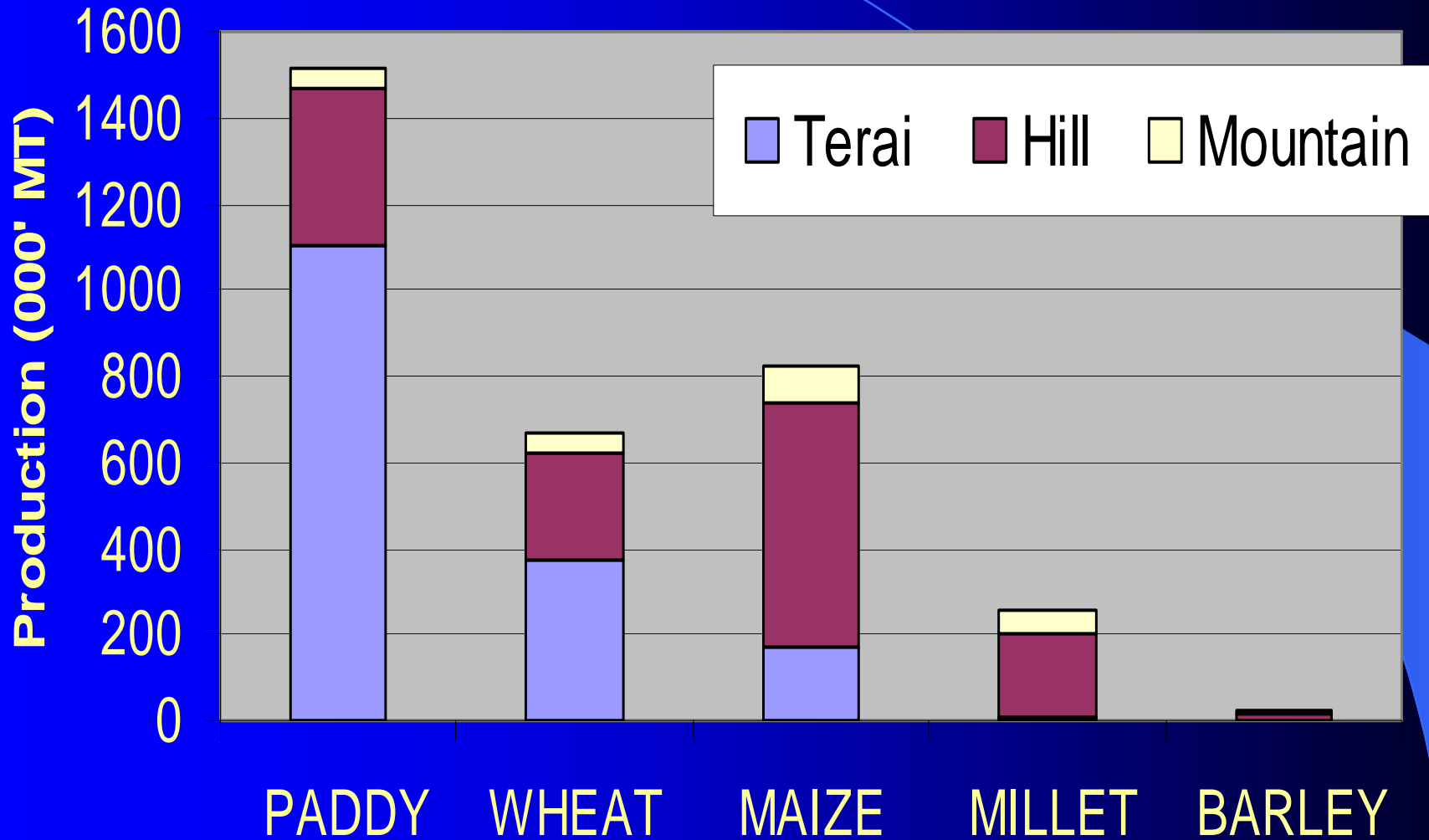
Physiographic Regions



Physiographic Regions and Cropping System



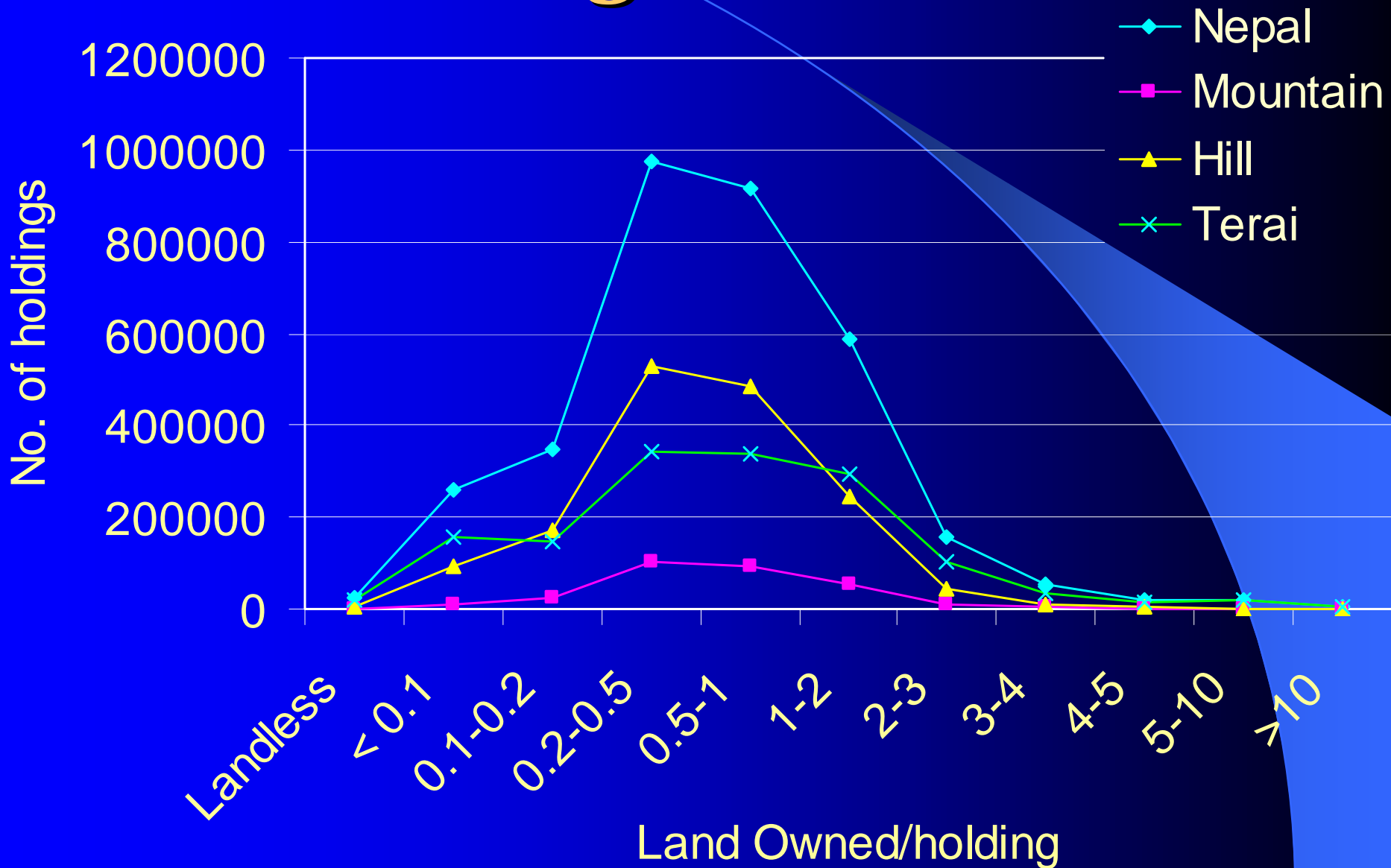
Cereal Crop Production by Physiographic Region



Land Holding

	No of Holding	Area of Holding	Av. holding Size, ha	Av. no of parcel/ holding	Average size of parcel, ha
Mountain	298,223	218,707	0.73	4.03	0.18
Hill	1,586,406	1,038,615	0.65	3.18	0.21
Terai	1,479,510	1,396,716	0.94	3.20	0.29
Nepal	3,364,139	2,654,037	0.79	3.27	0.24

Land Holding Size Distribution



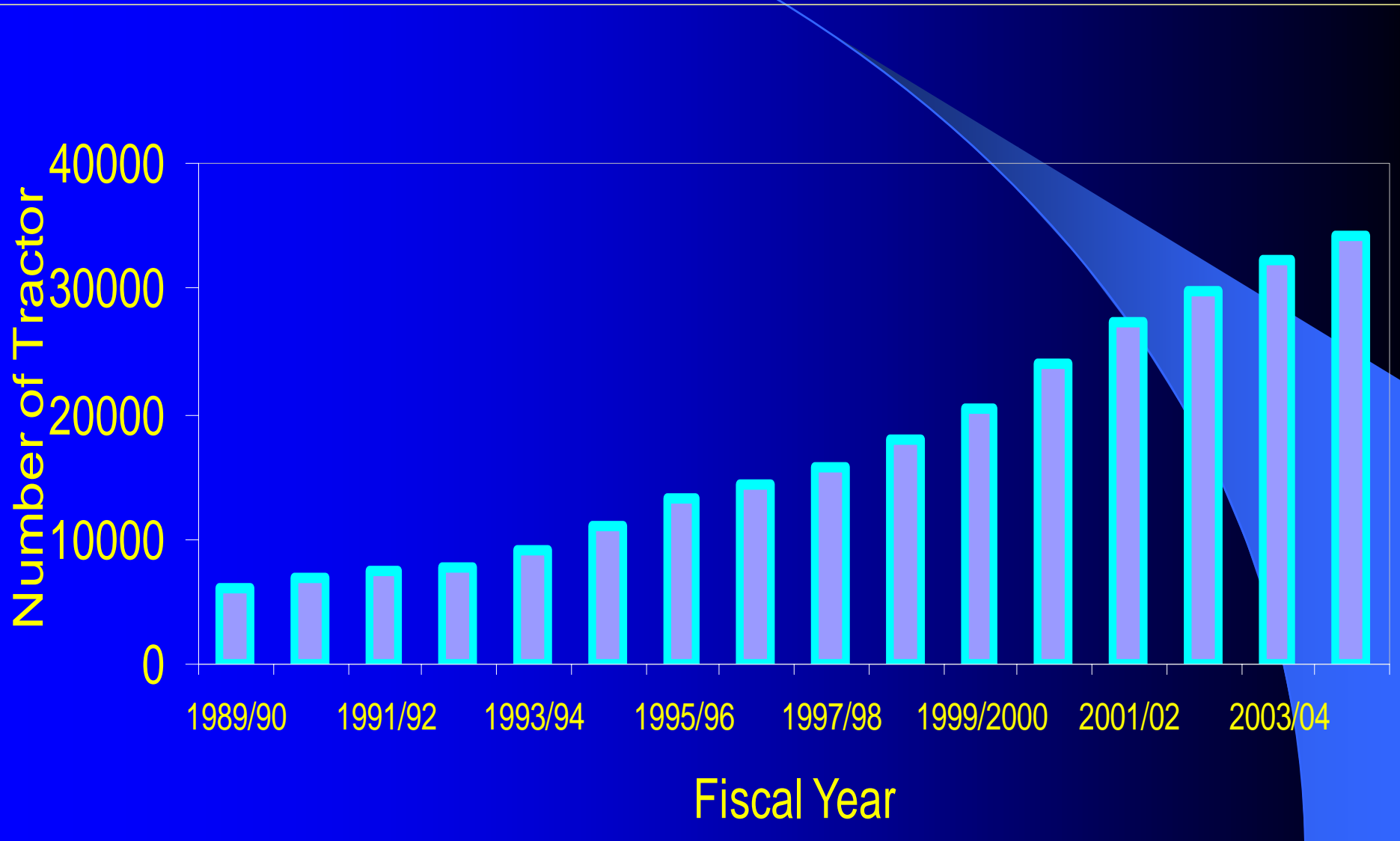
Major Feature of Agricultural Mechanization

- Subsistence agriculture, small land holding , cultivation in narrow terrace and sloppy land.
- Draft animal power (bullock) is the major source of power in the hills for land preparation
- Only 1.5 % of the farmers in the hills & mountain use power tiller for land preparation (CBS 2001)
- Only about 3% farmers in the hills &mountain use mechanical thresher (CBS 2001)
- In terai, use of 4 wheel and 2 wheel tractor (34000 tractors), use of diesel pump sets, threshers etc. increasing registered.

Constraints of Mechanization

- Subsistence farming and lack of investment
- Poor infrastructure road, electricity, workshops, market, etc.
- Lack of government policy
- Weak research and promotion organizations
- Technical constraints
- Small and fragmented land
- Difficult terrain
- Lack of light weight, multipurpose, low cost machine

Year wise Tractor Population in Nepal



AGRICULTURAL MECHANIZATION RELATED INSTITUTIONS

- Agricultural Engineering Division (AED), NARC
- Agriculture Implement Research Center (AIRC), Ranighat
- Agricultural Engineering Directorate, DOA
- Alternate Energy Promotion Center
- Agricultural Development Bank and other financial intermediaries.
- Private Sector (importers/ distributors/ fabricators of agri machineries)
- NGOS/ Projects
 - IDE
 - REDP

Contributions Made by Agril Engineering R & D institutions

	Institutions	Type	Major Contributions
1	AED & AIRC	Research	Iron Plough, paddy thresher, zero till & minimum till technologies, grain and seed dryers, cardamom dryer, plastic house for vegetable cultivation, solar dryers, small scale processing tech. (corn Sheller, improved quern, millet pearler),
2	RECAST	Research	Improved cook stove, solar dryer
3	Agri. Engg. Directorate	Dissemination	Recently established

Contributions Made by..... Contd.

	Institution	Type	Major Contributions
4	AEPC	Coordinating institution for Renewable energy technologies	<ul style="list-style-type: none"> ● Improved cook stove ● Biogas ● Micro hydro ● Solar technologies (Solar PV, dryers etc.)
5	ADBN	Credit	Major institution involved in financing for tractors, pump sets, agro processing mills etc.
6	NGOS/ Projects		
A	IDE	NGO	Promotion of Micro irrigation & treadle pump
B	REDP	Project	Promotion of Micro Hydro & RET
C	CRT	NGO	Promotion of ICS & Water mill

Agricultural Machineries Industries

Issues & Constraints:

- Low technical and investment capacity.
- High cost of raw material and its availability
- Small scale and not organized.
- Need protection from government through favorable policy

ISSUES & CONSTRAINTS RELATED TO AGRICULTURAL MECHANIZATION

- *Social Issues*
- *Small & Fragmented Land Holding*
- *Gender Issues*
- *Technological Issues & Constraints*
- *Poor Condition of Blacksmiths*
- *Lack of Recognition of Farm Machinery Custom Hiring Enterprise*
- *Policy Issues*
- *Institutional Issues & Constraints*
- *Infrastructure Constraints*

STATUS OF FOOD CHAIN MANAGEMENT AND AGRO ENTERPRISE DEVELOPMENT :

Cereal Crop

- Rice, maize, wheat, millet and barley are major cereal crop
- Deficit of cereal Crops in Hills and Mountains
- 86 small and medium sized establishments for grain processing mills
- Food Corporation supply food to deficit districts
- Association of rice, oil and pulse industry with 40 member industries
- Flour mill association with 19 member flour mills

Ecological belt wise production and requirement of cereal crops (2004/05)

Ecological Zone	Total edible	Require-ment	Balance (+,-)
Mountain	270669	335352	-64683
Hills	1880022	2167945	-287923
Terai	2733680	2168047	565633
Nepal	4884371	4671344	213027

STATUS OF FOOD CHAIN MANAGEMENT.....

Oilseed:

- Total Production 141990 MT
- Nepal is a net importer of oil seeds and products from overseas, palm oil and other crude oils
- Association of vegetable ghee and oil industries with 15 member industries.

STATUS OF FOOD CHAIN MANAGEMENT.....

Cash Crops:

- Potato, Sugarcane and Tobacco are major cash crop
- There are two major cigarette factory and 12 sugar mills established in terai.
- There is an association of sugar mills in Nepal with 10 member mills.
- Major importer of sugar in Nepal is salt trading corporation and national trading corporation.

STATUS OF FOOD CHAIN MANAGEMENT.....

Fruits & Vegetables

- 465 thousand MT Fruit & 2065 thousand MT of Vegetables Produced
- Vegetable as income generating enterprise
- Potential of off season and organic vegetable
- 5 large scale and many small scale producers of fruits & vegetable processing mills Total production capacity of large mills is 52900 MT

STATUS OF FOOD CHAIN MANAGEMENT.....

Other Emerging crops

- Cardamom
- Herbs
- Coffee
- Tea
- Flower
- Honey

STATUS OF AGRO- BASED ENTERPRISE DEVELOPMENT IN NEPAL:

- From Agro enterprise 26.16 billion rupees of value added to Nepal's economy,
- Contributing about 5 percent to Nepal's overall GDP.
- Major agro enterprises are
 - Processing of cereals like rice and wheat,
 - Animal products like milk, cheese, ghee, meat and meat products,
 - Confectionery items such as sugar, honey, candies and biscuits,
 - The production of poultry feed, and
 - Carpet and wool processing

STATUS OF AGRO- BASED ENTERPRISE.....

- 1134 nos of medium and large manufacturing agro enterprise providing direct employment to over 59000 workers.
- More than 24000 manufacturing small establishments providing employment to more than 20000 workers

Major Stakeholders

- Traders, Merchants, Whole seller
- Processing Industries
- Department of Agriculture
- Department of Livestock Services
- Department of Co-operative
- Department of Industries
- Universities and Technical Training Centers
- Department of small and cottage industries
- Department of food technology and quality control
- Department of Trade and Commerce
- Trade Promotion Centre
- NARC
- Department of quality control and meteorology
- Agro Enterprise Centre
- Food Corporation
- Banks and Financial Intermediaries
- Agriculture Input Company Ltd.
- Retailer
- Commodity Association
- Consumer's forum
- NGOs/INGOs
- Consumer

AGRICULTURAL COMMODITIES IMPORT SCENARIO

- Major import of agricultural commodity is from India.
- Commodities that imported from India are fruits, rice, thread, pulses, spice etc.
- Total import of agricultural commodities is more than 4.3 billion NRs in F Y 2004/05.
- Apple and ginger is major agricultural commodity imported from China (Tibet) and total import of apple and ginger from China (Tibet) in F Y 2004/05 is Rs. 0.12 billion NRs.
- Agricultural commodities from overseas countries other than India and China (Tibet), oil and oil seed has major share and total import in F Y 2004/05 is about 12 billion NRs.

Potential Commodity for import

(a) High potential

- Crude palm oil, soybean oil, crude coconut oil, animal or vegetable fat, industrial monocarboxylic fatty acid, nepathenic acid and other oil products.
- Spices and culinary herbs – cloves, cardamom, and other spices

(b) Moderate potential

- Fragrances and flavours – essential oil and mixtures of odoriferous substances.
- Fruits and fruit juices.
- Speciality food products – jam, fruit jellies, soups, food preparation etc.

(c) Low potential

- Cereals and cereal products.
- Honey and apicultural products.

AGRICULTURAL COMMODITIES

EXPORT SCENARIO:

- Export of agricultural commodities to India is mainly dominated by vegetable ghee, cardamom, herbs, pulses, jute products, oilcake, bran etc.
- Total export of agricultural products to India in F Y 2004/05 is about 12.6 billion NRs.
- Rice, wheat flour, fruit juice, beaten rice is found to be exported to Tibet. Total export of agricultural produce to Tibet in FY 2004/05 is about 0.47 billion NRs.
- Agricultural commodities to overseas countries tea, cardamom, pulses, sugar has major share and total export of agricultural commodities in F Y 2004/05 is 1.1 billion NRs.
- High scope of export of organic vegetables, off season vegetables, apiculture products, herbs, tea, organic coffee, fruits, vegetable seeds, ginger products, cardamom, sugar etc.

ISSUES RELATED TO FOOD CHAIN MANAGEMENT AND AGRO-ENTERPRISE DEVELOPMENT

- Lack of detailed study on food chain & value chain management of major commodities
- Lack of operational fund and limited access to credit
- Old machinery/ technology
- Lack of information on markets and marketing opportunities,
- Interruptions in the supply of electricity Scattered production of raw materials (agricultural produce)
- Increased price of raw material (agricultural produce) compared with Indian product
- Weak Linkage & co-ordination between the agencies involved in value chain management & agro enterprise development
- Inadequate development of quality control and regulatory mechanisms
- Lack of research and development on marketing, grading, processing, packaging etc. of agricultural produce
- Need of policy reform for encouraging private sector and foreign investment

Expected Support from APCAEM

- **Capacity building of institutions involved in agricultural production, marketing and processing**
- **Capacity building of agro related metal working industries**
- **Human Resource Development**
- **Strengthening the APCAEM National Institute:**
- **Joint action research project development**
- **Small scale post harvest technology in fruits and vegetables**
- **Cottage & small scale processing of herbs and medicines**
- **Pilot scale value chain management in “one village- one commodity” program**