

A. Crop Production

Name of Technique	Sources or Origin	Significance	Components	Impact
Wheat-cotton inter-planting with irrigation through plastic film		Water and plastic film have multiple uses. A new water saving and yield increasing irrigation technique	The inter-planting techniques of wheat and cotton covered with plastic film (applying base manure better determining the width suitable for water content, piercing plastic and planting the seedling), the techniques of irrigation through the plastic film (speed of water running, suitable length of flow ditch, water discharge of single ditch the quality of irrigation water)	30% less water is needed for wheat and 40% for cotton
Technique of ploughing-free with inter-cropping and inter-planting	A History of Modern Agricultural Sciences and Technology in China	It is useful to take advantage of both temporal and spatial resources and green fertile fields	Planting later-rice between intervals of early-rice, or inter-planting cotton in the wheat field or inter-cropping wheat with bean rice with beaten or rice with fertilizer	Increases multiple crop index and multiple cropping area
Crop rotation	A History of Modern Agricultural Sciences and Technology in China	Wipes out weed, reducing insect pests and plant diseases and increasing crop production	Continuously planting rice, millet and hemp is forbidden, planting leguminous crops before planting grain crops	Greatly increases the crop yield
Three crops in two years	A History of Modern Agricultural Sciences and Technology in China	Increases utilisation rate of land, light, temperature and water resources	In hilly fields: planting wheat at first, then bean, then Chinese sorghum, millet etc	Raises crop yield and improves land productivity
Rice-bean inter-crop	A History of Modern Agricultural Sciences and Technology in China	Increases crop output and maintains soil health	Planting beans before rice, harvesting	Yields more beans and improves land productivity
Wheat-bean inter-cropping	A History of Modern Agricultural Sciences and Technology in China	Increases crop yield and maintains land productivity	Planting broad beans along the side of wheat fields; planting peas with barley etc	Keeps land productivity sustainable
Rotation system	ZhuHe County Annals	Combines land use and land maintenance	Bean, Chinese sorghum, and millet rotation in 3 years	

B: Land Preparation and Soil Fertility

Names of Technique	Sources of Technique	Importance and Significance of Technique	Key Technique	Benefits
Compound fertilizer to match supply and demand of soil nutrients Conserving soil moisture	Chinese Academy of Sciences A History of Modern Agricultural Sciences and Technology in China	Promotes the productivity of the following significantly: rice, wheat, barley, rape, cotton, potatoes, flax, etc Ploughing deeply to conserve soil moisture, there is no serious harm if there is no rain in slack fields during the summer Soil of water fields for rice cultivation is solid inside but loose outside	Compounding fertilizer according to soil nutrient supply, nutrient demand and different crop requirements Ploughing shallowly to remove stubble, ploughing deeply to store soil moisture, raking and grinding to gain soil moisture	Increases productivity by 10 to 20 per cent Good yield in case of drought
Ploughing, raking and pressing of water fields	A History of Modern Agricultural Sciences and Technology in China	Functions as a cold resistant Saline-alkaline fields are improved and production is increased to normal or high	Ploughing field in winter, raking shallowly, ploughing field in spring, raking rice stubble, smashing soil to pieces after raking When sowing in seedlings, dip the roots in bone ash Plowing high and turning up the soil high, scraping saline and alkaline, spreading strange soil, building mess fields, spreading sand and covering up with grass	Beneficial to rice growth Gives fertilizing effect to seedlings Unproductive land converted into highly productive land
Applying bone ashes on rice roots Integrated technique of improving saline-alkaline land	A Study on Agricultural Sciences and Technology in China A History of Modern Agricultural Science and Technology in China			

C. Moisture Conservation and Irrigation

Names of Technique	Sources of Technique	Importance and Significance of Technique	Key Technique	Benefits
Springs water in valley flying channels	A Study on Agricultural Sciences and Technology in China	It is helpful in solving the problem of supplying water to the fields in valleys	Storing water in big or small ponds or building small reservoirs to store water in lower reaches, and building bamboo channels when springs are blocked by ridges	Irrigation for higher production
Buckwater weir or dam Irrigation techniques of drawing water	A Brief History of Water Conservancy of the Yellow River A Study on Agricultural Sciences and Technology in China	Solving the irrigation problem when fields are higher than the water level Developing irrigation on sloping fields	Raising water level of the river course Building ponds on slopes and drawing water hidden within mountains into the ponds	Increases area under irrigated cultivation Increases irrigated area
Underground irrigation channels	Ten Popular Agricultural Techniques	Land and water conservation	Tile-made tube or under earth stone-channel around mountain	Water losses significantly reduced

D. Pest Control

Name of Technique	Sources or Origin	Significance	Components	Impact
<p>Biophylaxis prevention and control technique for bean diseases and insect pests</p> <p>Biophylaxis prevention and control technique for cane diseases and insect pests</p> <p>Expunging pests with duck herding</p>	<p>The Comprehensive Prevention and Control of Crop Diseases and Insect Pests</p> <p>The Comprehensive Prevention and Control of Crop Diseases and Insect Pests</p> <p>Records of locust expunging, texts of locust control</p>	<p>Reduces costs and pesticide pollution</p> <p>Reduces costs and pesticide pollution</p> <p>Controls pests by using natural enemies, low cost, no pollution</p>	<p>The biotic-control is carried out by natural enemies of soybean pests such as trichogramma, baityris, bacteria etc.</p> <p>Controls white sugarcane borer, striped borer, stem borer by trichogramma and fabricius</p> <p>Ducks can eat locusts when they are still young, catching locusts by ducks is not as good as catching locust nymphs by ducks, catching nymphs is not as good as digging them, is not as good as rooting them out, and so on</p>	<p>Has notable ecological and economic benefits</p> <p>Has notable ecological and economic benefits</p> <p>Has notable effects</p>
<p>Ploughing deeply and irrigating in winter to freeze pests to death</p> <p>Proper rotation of crops to prevent pests</p>	<p>Farmers' minds and words</p> <p>Talk on Agriculture</p>	<p>Prevents pests by ploughing technique</p> <p>Taking prevention as a key link in reducing loss</p>	<p>Ploughing deeply and irrigating in winter to freeze the pests and their eggs to death</p> <p>Rice-cotton rotation, rice culture is notably successful in drowning land worm</p>	<p>Alleviating harm</p> <p>Effective performance</p>
<p>Applying ash agents for controlling pests</p>	<p>A History of Modern Agricultural Science and Technology in China</p>	<p>Prevents and controls pests with lime, rice straw ash, wood ash and chrysanthemum ash</p>	<p>Lime can heat soil and kill pests, spreading the powder of rice straw ash and lime on the lips of rice and wheat can save them being eaten by locusts, killing locust eggs with lime water can get twice the result with half the effort, controlling wheat moth with chrysanthemum ash</p>	<p>Effective</p>
<p>Controlling and preventing potato diseases and insect pests</p> <p>Controlling wheat diseases and insect pests</p>	<p>Brief investigation of agricultural production in Fujian perfection</p> <p>The Comprehensive Prevention and Control of Crop Diseases and Insect Pests</p>	<p>Controls diseases and eliminates pests with natural enemies and no pollution</p>	<p>Using copper sulphate lime liquid, 0.25kg copper sulphate, 1 kg lime, 1.5 hectolitre of water, mixing them evenly</p> <p>Preventing and controlling eastern tent caterpillar with <i>Alaptus westwood</i></p>	<p>Effective</p> <p>Parasitic rate of the trichogramma to pear core pear's egg is over 95 per cent</p>
<p>660B</p>	<p>Chinese Academy of Sciences</p>	<p>Controls more than 20 kinds of fungal diseases</p>	<p>660B preparation</p>	<p>Prevention and control effect about 75 per cent success rate and field crop output is increased by 8 per cent</p>

E. Animal Production

Name of technique	Sources or origin	Significance	Components	Impact
Poultry hatching	A History of Modern Agricultural Science and Technology in China	It can be applied in border areas	Heat source for artificial hatching: 'to incubate in the hot season by fried chaff or by fried wheat and hatch in hot season by horse urine'. Direct heating 'put duck eggs in the chaff, and smoke them slightly by charcoal fire'	With excellent benefits
Cattle and sheep fattening	A History of Modern Agricultural Science and Technology in China	Developing fattening techniques; making use of the superiority of agricultural areas and pastoral areas	Buying old and weak cattle and sheep from pastoral areas in winter when there is a lack of grazing grass and fattening them in agricultural areas using plenty of straw resources	With excellent benefits
The method of giving drugs through the animal's rectum	A History of Modern Agricultural Science and Technology in China	Having good effects on constipation	Making a cake with castor bean, honey and onion and placing it in the animal's anus, the animal's defecation is instantly assured	With excellent benefits
Technique for temporarily suturing the anus	A History of Modern Agricultural Science and Technology in China	Having good effects on prolapsed rectums and avoids muscle and tissue damage	For any cattle suffering from this disease, shower the prolapsed rectum with warm water from a tin bottle, smoking the diseased part with one or two incense burners, making bloated gas and extravasated blood clean. After doing so, wash it with cooled water, decocted from dried Chinese mugwort, then lightly fill the anus with seasame oil and temporarily close it by suturing.	With excellent benefits
Disinfectants for animals	A History of Modern Agricultural Science and Technology in China	Annihilates parasites	Decocting dried Chinese mugwort, gypsum, mirabilite, root of Zhejing figwort and some other Chinese herbal medicines with water and washing the animals when the water is cooled, so as to avoid infections	With excellent benefits

Annex 2

Apple cultivars used in the Hengduan Mountains of China

- American Summer Pearman
- Golden Delicious
- Starking
- Jonathan
- White Winter Pearman
- Rall's
- Huanong No. 1
- Yellow Transparent
- Red Transparent
- McIntosh
- Cravenstein
- Ben Daris

(Zheng et al. 1993)

Annex 3

Traditional Farm Implements and Ethno-Engineering for Self Sustenance in Ladakh

Farm implements have been developed/modified through the experiences of previous generations and emerging socioeconomic and farming challenges.

- i) *Khazas*: Structure with nail-like formations on a piece of wood, attached to a long rod; used for the collection of straw
- ii) *Nyashing*: A wooden structure used for bullock support
- iii) *Okham*: A wooden structure used for assembling wheat grains
- iv) *Ongmol*: Broom made from wild grass known as *chipkyang*; localised in Shashoot village; commercial sale of the grass is common
- v) *Pankha*: Used for assembling wheat grain; comprised of a long wooden stick/ rod (1 to 1.3m) with a semi-circular structure in front
- vi) *Phat*: Gunny bag prepared from goat hair; can carry up to 100 kg
- vii) *Staybo*: A small axe
- viii) *Shawl*: Local plough
- ix) *Taspo*: Wooden basket
- x) *Tsagsma*: A sieve (large one)
- xi) *Zar*: Structure used for winnowing of farm produce; made from wood with five finger-like elongations at the apex
- xii) *Zora*: A small sickle used for cutting grasses/farm produce

Annex 4

Traditional Implements of Himachal Pradesh

Local name	English name	Use	Approximate value (Rs.)	Service life(yrs)
<i>Chagwal</i>	Spade	Carrying earth	13	5
<i>Chutse</i>	-	Chiselling	5	3
<i>Dranti</i>	Scythe	Harvesting the crop	4.25	4
<i>Gainti</i>	Pick axe	<i>Kuhl</i> making, harvesting of <i>kuth</i> and digging out stones	18	4
<i>Jhabbal</i>	A large iron rod with a sharp end	Digging out big stones	22	10
<i>Jathugza</i>	Sharp blade fitted to a crooked wooden handle	Harvesting the crop	4	3
<i>Kahti</i>	Mattock	For making <i>kuhl</i> , embankments	4	2/3
<i>Karji</i>	Axe	Cutting wood	16	3
<i>Khawang-shing</i>	Yoke, or <i>punjali</i> similar to the one in the plains	Yoking the bullocks for ploughing	15	3
<i>Ngal</i>	Wooden plough with an iron blade	Ploughing	35	2
<i>Okthan</i>	Same as <i>kudal</i>	Clod-crushing and levelling of land	6	2
<i>Surmn</i>	Iron hook attached to a wooden handle	Hoing and weeding	8	2
<i>Thowa</i>	Hammer	Breaking big clods	6	12

Annex 5

Fruit and Vegetable Varieties in The HKH Region of India

A. Apples

i) Himachal Pradesh

- Delicious group, i.e. Red, Starking (Royal), Golden Delicious, Rich-a-Red
- Others group, i.e., Red June, King of Pippin, Worcester Peerman (early varieties); Red Gold, Granny Smith, Rust Pippin, Winter Delicious (late varieties)

ii) Jammu and Kashmir

- Maharaji - white dotted red
- Delicious group
- American - Apirouge
- Ambri

B. Other Fruits

- Peach - Elberta, July Elberta, J.H. Hale
- Plum - Santarosa, Mariposa, Greengage
- Apricot - Safeda, Kaisi and Ambrosie, Nari
- Cherry - Red and Black Heart
- Almond - Thin shelled, Non Pareil
- Pineapple - Giant Kew, Queen and Mauritius

C. Vegetables

- Brinjal (aubergine, egg plant) - Pusa, Purple Long, Pusa Purple Cluster, PH-4, Pusa Kranti, Pant Samrat, Azad Kranti, Arka Navneet, Pant Rituraj, T-3, Jamuni, Arka Kasumkar, Panjab, Bahar.
- Chilli - Andhra Jyoti, Bhagyalakshmi, Kouilpatti
- Cauliflower - Pusa Deepali, Pant Subhra, Improved Japanese, Pusa Synthetic, Pusa Snowball-I, Pusa Snowball K-I
- Carrot - Pusa Yamdagni
- French Bean - VL Boni - I
- Mushroom - Hara Madhu, Pusa Sarbati, Pusa Madhuras, Arka Rajhans, Arka Jeet, Durgapura - Madhu

Annex 6

Various Fruit Varieties of Balochistan, Pakistan

Almond

Pastasha
DFDC Late
Kaghazai
Mongphali
Non Pareil
Texas

Apple

Granny Smith
Starking Delicious
Gloucester - 69
Kids' Range
Spartan
Katy
Tydesman Early Worcester
Staskrimsan
Belgolden
Smoother
Summer Red
Gala
Katja
Topred
Anna
Fuji
Ultra Red
Delbard Jubilee
Royal Gala
Golden Blush
Jonathan
Hybrid

Apricot

Goldrich
Beogeran
Hard Grand
Prete
Den Gaetano
Peshawar-II
Char Maghaz
Narai
Sardai

Cherry

Bing
Black Tatarian
Black Circadian
Early Rivers
White Heart

Exotic Olives

Frantoio
Pendolino
Moraiolo
Leecino
Coratino
Bianocolila
Carolea
Ottobratica

Grape

Kighish
Haitha

Annex 7

Suitable Varieties of Vegetables for Mountainous Areas of Pakistan

- Beans - Contender
- Cabbage - Golden Acre (early variety), Drain Head (late crop)
- Carrot - Nantes, Chantency
- Cauliflower - Snow Ball, Snow Drift
- Chinese Cabbage - Granat, Michihili
- Lettuce - Great Lake
- Okra - Perkinson Spineless
- Onion - Texas Sweet Grano, Shangshu
- Peas - Arkel, Green Drift
- Pepper - Yellow Wonder, California Wonder
- Potato:
 - Balochistan - Eigenheimer, Patrons, Multa, Atlantic (all white)
 - NWFP - Utimus (red, 1958), Desiree (red), Cardinal (red, 1972), Patrones (white), Multa (white).
- Cosima (white, 1977), Atlantic (white)
- Northern Areas - Desiree (red), Cardinal (red), Diamond (white)
- Punjab - Ultimus (red, 1958), Desiree (red), Cardinal (red), Patrones (white), Ajax (white, 1975), Wilja (white, 1976), Atlantic (white), Lal-e-Faisal (red, 1982), Diamond (white)
- Radish - All Season, Minnow
- Squash - Petra, Caserta, Grey Zucchini
- Table Beet - Betroit Dark Red
- Tomato - Maglobe, Roma
- Turnip - Purple Top, Golden Ball (for very high altitudes)

(Alam 1993)

Annex 8

Genetic Resource Diversity in Pears and Apricots in Mountain Areas of Pakistan

Vernacular name of variety	Distinguishing feature as reasons for folk selection (existing agroclimatic adaptation)
A. Apricot	
<i>Ali Shan Kakas joo</i>	Late
<i>Alman joo</i>	Good quality
<i>Apo choli</i>	Large size
<i>Beru choli</i>	Small size
<i>Blafo choli</i>	Small, red
<i>Bro choli</i>	Late maturing
<i>Brook choli</i>	-
<i>Brum joo</i>	White
<i>Brun joo</i>	-
<i>Cho choli</i>	Juicy
<i>Chun choli</i>	Sweet pith
<i>Duda-sanang joo</i>	-
<i>Dudar joo</i>	-
<i>Duspaong choli</i>	Selections due to specific agro-ecological characters
<i>Gakateen joo</i>	-
<i>Gario joo</i>	-
<i>Ghaka joo</i>	-
<i>Ghom choli</i>	-
<i>Ghulam joo</i>	-
<i>Gurdaalo choli</i>	Like peach
<i>Habi joo</i>	Very late
<i>Halman choli</i>	Best quality
<i>Halwar choli</i>	-
<i>Hongool choli</i>	-
<i>Kacha choli</i>	Hard, good to keep
<i>Kaka shikanda joo</i>	-
<i>Karfoo choli</i>	White apricot

Vernacular name of variety**Distinguishing feature as reasons for folk selection (existing agroclimatic adaptation)**

Karopiam joo	-
Kartach joo	Very early, white
Kartaksha	Early, juicy
Kazangi choli	Sweet
Khakas choli	Kernel partly split
Khanemish joo	-
Khashanda choli	Good taste
Kho choli	Bad taste, sour
Khustar choli	-
Koropian joo	Early
Mamoor choli	-
Mamoor joo	-
Marghlam choli	Early, good quality
Marpho choli	Red apricot
Miting choli	Sour, kernel used for oil
Moen joo	-
Odumar choli	Partially red
Pharang choli	Dry apricot
Rashikin joo	Early
Sapastan choli	Sour, kernel used for oil
Sara choli	-
Sara karfo choli	Early
Shakanda choli	Sticky
Shakar choli	Sweet
Shanda choli	Small size, early
Shikanda joo	-
Skardu area	
Snair choli	Selections due to specific agro- ecological characters
Stun choli	Late maturing
Stun kuban choli	-
Surasune joo	Good quality
Tacho choli	-
Warfo choli	Pith used for oil
Yakab yak choli	Selections due to specific agro-ecological characters
Yakar choli	Reddish

B. Pear

Bap Tango	Early
Batang	Large, pear shape, sweet

Vernacular name of variety**Distinguishing feature as reasons for folk selection (existing agroclimatic adaptation)**

Gadaray Tango	-
Khan Tango	Small, round
Khapa	Sour
Khar Nak	Large, hard
Khawaga maiwa	Small, round, sweet
Mamusay	Small to medium, round, early
Nag Tango	Large, apple shape, hard
Nar	Oblong to pear shape
Nashpati	Medium to large, sweet
Parao	Large size, pear shape
Shakar Tango	Sweet medium size
Shal Tango	-
Shin Kulay	Medium, apple shape
Spin Tango	Small, round
Sur Tango	Small, round
Tang	Large, pear shape

(Partap 1993)