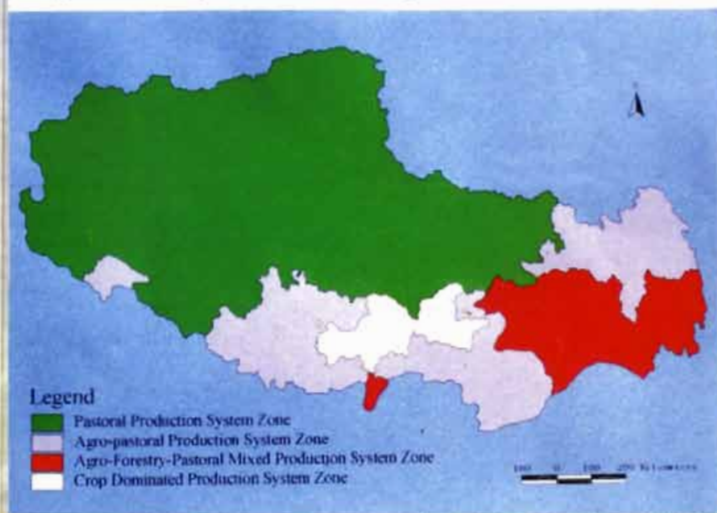


Making Tibet Food Secure









Assessment of Scenarios

Major food-production systems in Tibet



Nyima Tashi
Liu Yanhua
Tej Partap

about ICIMOD

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Making Tibet Food Secure

Assessment of Scenarios

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TEJ PARTAP

International Centre for Integrated Mountain Development (ICIMOD)
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Background

Farmland in Central Tibet (Gongga County)
- *Nyima Tashi*

Insets

Major Production Systems of Tibet - Tej Partap
The staple crop - Naked Barley in Central Tibet and the well known
TAAAS Scientist Nyima Tashi the breeder in the barely field
- *Tej Partap*

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Dedication

This book is dedicated to my late mother, who
unfortunately passed away before its
completion

Foreword

The Tibetan plateau is a vast area of soaring mountains, moving glaciers, high altitude plains, turquoise lakes, and steep gorges. This high mountain area covers over one-third of the Hindu Kush-Himalayas (HKH) and one-fifth of the area of China, along with smaller parts of most neighbouring countries in the region. The great rivers of Asia originate in this area, including: the Brahmaputra (Yalongzangpo), the Ganges/Pong Qu, the Indus (Shiquan He), the Mekong (Lancang), the Yangtze, and the Yellow rivers. Averaging around 4,000 metres above sea level, much of the central and western parts of the Tibetan plateau receive limited rainfall. Low temperatures and limited arable land also constrain the growing season.

The Tibet Autonomous Region of China occupies 1.2 million square kilometres of this region with more than 2.5 million Tibetan inhabitants. Although agricultural and pastoral systems have evolved over the millennia to provide uniquely adapted subsistence livelihoods, most of the population depends on food production from environmentally fragile and socioeconomically marginal production systems. Livelihoods are vulnerable to weather and outside forces, and subsistence depends on combining agriculture with pastoralism and trade.

Increasing food security in Tibet has been a government priority for the last 40 years. However, the unique ecological and socioeconomic circumstances of this remote mountain area have constrained the effectiveness of technologies developed in the plains, and reduced market opportunities. Expensive transport and limited purchasing power have made the supply of food from outside difficult. The adoption of a policy for food self-sufficiency by the Government of the Tibet Autonomous Region in 1994 has enabled production to increase in recent years.

However, there remains a knowledge gap about food production and food security in Tibet. There have only been limited studies on the food production systems currently used, the changing trends in food supply and demand, and the scope for improving production and food security.

This study by Dr. Nyima Tashi is thus a major contribution to the understanding of food security issues in Tibet and the formulation of appropriate policies. It focuses on assessing the scenarios for food security in spatial and temporal dimensions. It identifies current status and trends in both production and consumption in various zones.

The research for this book was carried out under ICIMOD's Tibet Fellowship

Programme with funding from the Royal Netherlands Embassy in Beijing. Dr. Nyima Tashi was the first of four candidates for Ph.Ds in this programme. His research was conducted under the direct supervision of Dr. Liu Yanhua, currently the Deputy Minister of the Ministry of Sciences and Technology, China, and Dr. Tej Partap, currently the Vice Chancellor of CSK Agricultural University of Himachal Pradesh, India (formerly Head of Mountain Farming Systems, ICIMOD). ICIMOD is grateful to these scientists for initiating and managing the Tibet Fellowship

Programme and their contribution to human resource development and capacity building in Tibet.

ICIMOD is also grateful to our partners in this fellowship programme: the Institute of Geographical Sciences and Natural Resources Research of the Chinese Academy of Sciences (CHECK) and the Tibet Academy of Agricultural and Animal Husbandry Sciences (TAAAS) for their continuous collaboration with and support for this programme.

J. Gabriel Campbell
Director General

Executive Summary

The Himalayan region has been studied extensively, but Tibet is often noticeably absent from such studies and discussions. Although an increasing number of researches and studies have been conducted recently, they tend to focus more on either the survival of the household or of the community than on biophysical processes. Broad-based research on the Tibet Autonomous Region as a whole that gives an overall picture of the region is necessary.

This publication focuses on the food security issue of the Tibet Autonomous Region. This research will begin with a general introduction to Tibet (Chapter 2) and then describe the local population's current access to food (Chapter 3) and identify different food production systems currently in use (Chapter 4). Changes in food production are discussed in Chapters 5 and 6, and changes in demand in Chapters 7 and 8. The potential to increase the productivity of various food-production systems is treated in Chapter 9, and policy recommendations to make Tibet food secure in the future are made in the final chapter (Chapter 10).

Tibet's food security is analysed based on key indicators such as the gap between food production and demand. Although food production has increased, the present situation of food security in Tibet is still not optimistic. Low per capita food production and food trade, great variations among

regions and fluctuation of food production over time; and relatively low energy intake by the indigenous people have shown the overall low level of food security in Tibet.

Socioeconomic and biophysical data were combined with GIS technology to identify the dominant food production systems. Four food production systems – crop-dominated, agro-pastoral, pastoral, and agro-pastoral-forestry – were delineated. Based on this analysis, the potential productivity of these different food production systems was examined in terms of their ability to raise both crops and livestock animals. The crop dominated food production system has a much higher potential food productivity than any of the other regions, and it must be the focal region if Tibet is to achieve sustainable food security. The pastoral food production system has been overstocked, and it is crucial to work on the conservation and sustainable use of the rangelands in Tibet.

There are great zonal variations of availability of per capita calories and protein; there has been a decline of total food production in the north and north-west, while production is increasing in central and south Tibet. Moreover, per capita production of cereals is low in north-western Tibet and high in central Tibet. These zonal variations of food grain production were attributed to change of cropland area, while the spatial dynamics were attributed to changes in per unit crop yields. There

has been a big increase in meat production, particularly in areas where cropping is possible. Milk production has declined in the pastoral zone, while it has been increasing in crop-dominated zone. Currently, meat and milk production bases are shifting towards central Tibet. Expansion of the crop-livestock farming system is desirable for further increasing both meat and milk production, while in the pastoral system, increases in per unit yield of meat and milk production are needed. The overall agricultural production structure is changing. The percentage of crop and forestry production value in gross output of agricultural production has increased, while the proportion of livestock production value has declined. But crop and livestock production still dominate agricultural production. Fluctuations in agricultural production have been due not only to climate variations but also to inappropriate and frequent changes in agricultural policy and input over time.

Although the balance between total production and total demand in Tibet has improved, deficits of special food items, such as rice, vegetables, pork, and so on (and the lack of high quality and nutritious food, shortages of food in some regions, and poor food distribution among regions), remained persistent problems. Food preference and consumption patterns are changing, driven by population growth and increase in per capita income. The gaps of income and consumption between urban and rural populations have been growing significantly, and the food preferences between the two are now quite different. In urban areas, food preferences and consumption are now getting close to the Chinese diet, while, in rural Tibet, food preferences remain more traditional, focusing mainly on tsampa, yak meat, butter tea, and chang (barley beer). Although overall more food is produced than the minimum required, there are food-deficit counties that are trying to become self-sufficient. Already a policy promoting cereal self-sufficiency is in place. New policies and external investments are opening up new opportunities for economi-

cally productive agriculture. The policy of “central government concerns and nationwide support” propounded in 1994 has stimulated huge investment and technical and staff support to develop Tibet. As a result, food production has increased steadily, and food security has been enhanced.

However, many weaknesses remain. Economic transfusion is a trap from which the Tibetan agroecology has not been able to extricate itself; changes in thinking and perceptions have been slow. Food shortages are the manifestation of low farm productivity and a fragile agroecosystem in Tibet. Underdeveloped and low capacity markets are an obstacle to developing a commercial farm economy. Science and technology have not been applied to maximise agricultural resource potential. Thus, Tibet faces many challenges, including increasing food demand and limited cropland; increasing demand for livestock products and low carrying capacity rangelands; increasing natural disasters in a fragile ecosystem; weak institutional capacity of agricultural research, an extension system unable to help transform traditional farming systems into competitive and commercialised production systems, and a fragile and marginal agroecosystem that is faced with large-scale investments from outside that will accelerate faster economic growth in Tibet.

To cope with these weaknesses and challenges, harnessing the comparative advantage of Tibet’s natural resources; promoting highland agricultural products for external markets; strengthening the application of agricultural technology; harnessing the potential for increasing cereal production; and developing the livestock production of the crop-dominated farming systems zone are the main options for making Tibet food secure.

Key Words: Food security, Tibet, food production, food supply, food consumption, changing scenarios, highland, scope for food security

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Nyima Tashi

Abbreviations and Acronyms

CAVAAIL	the average calorie availability
CAVREQ	the average calorie requirement norm
CAVUNNUR	the average availability of calories for the undernourished in the population
CP	crude protein
DBMS	database management system
FA	food adequacy
FAO	Food and Agriculture Organisation
GDP	gross domestic product
GIS	geographic information system
ICIMOD	International Centre for Integrated Mountain Development
ICN	International Conference on Nutrition
LIFDCs	low-income food-deficit countries
PTOTAL	total population
PUNNUR	number of undernourished individuals
SEU	sheep equivalent unit
TAAAS	Tibet Academy of Agricultural and Animal Husbandry Sciences
TAR	Tibet Autonomous Region
TDN	total digestible nutrients
UNDP	United Nations Development Programme
USA	United States of America

Note

1. Food energy equivalents are given in terms of kcal, the quantity of energy required to raise the temperature of 1 kg of water by 1°C. This unit is often written simply as 'calorie' and is approximately equal to 4,184 joules.
2. Food grain, in Chinese is called 'Liang Shi' and includes cereals, pulses and tuber crops.

Glossary

Ali	A prefecture in Tibet Autonomous Region; Ngari in Tibetan
Anduo	County name in Chinese Pinyin; Amdo in Tibetan
Angren	County name in Chinese Pinyin; Ngamring in Tibetan
Bai	A minority group in Tibet
Bailang	County name in Chinese Pinyin; Panam in Tibetan
Bange	County name in Chinese Pinyin; Palgon in Tibetan
Baqing	County name in Chinese Pinyin; Bachen in Tibetan
Baxu	County name in Chinese Pinyin; Paksho in Tibetan
Bayi Town	Chinese Pinyin name for a town in Nyinchi prefecture
Bianba	County name in Chinese Pinyin; Palbar in Tibetan
Biru	County name in Chinese Pinyin; Dirl in Tibetan
Bomi	County name in Chinese Pinyin; Pome in Tibetan
Buoyi	A minority group in Tibet
Changdu Town	In Chinese Pinyin for Chamdo town
Changdu	County name in Chinese Pinyin; Chamdo in Tibetan
Changdu	A prefecture in Tibet Autonomous Region; Chamdo in Tibetan
Changtang	The vast northern land of Tibet (in Tibetan)
Chaya	County name in Chinese Pinyin; Dayak in Tibetan
Chengdu	The capital city of Sichuan Province
Cultural Revolution	Pronounced by Chairman Mao and undertaken during 1966-1976
Cuomei	County name in Chinese Pinyin; Tsome in Tibetan
Cuoqin	County name in Chinese Pinyin; Tsochen in Tibetan
Dangxiong	County name in Chinese Pinyin; Damshung in Tibetan
Dazi	County name in Chinese Pinyin; Taktse in Tibetan
Dengba	A minority group in Tibet
Derung	A minority group in Tibet
Dingjie	County name in Chinese Pinyin; Tingkye in Tibetan
Dingqing	County name in Chinese Pinyin; Tengchen in Tibetan
Dingri	County name in Chinese Pinyin; Tingri in Tibetan
Drogba,	A nomad group (Tibetan)
Dueba	Tibetan name for people from western Shigatse and Ali Prefecture in western Tibet
Duilongdeqing	County name in Chinese Pinyin; Tolung Dechen in Tibetan
Gaize	County name in Chinese Pinyin; Gertse in Tibetan
Gangba	County name in Chinese Pinyin; Gampa in Tibetan

Ge'er	County name in Chinese Pinyin; Gar in Tibetan
Geji	County name in Chinese Pinyin; Gakyi in Tibetan
Gongbujiangda	County name in Chinese Pinyin; Kongpo Gyamda in Tibetan
Gongga	County name in Chinese Pinyin; Gonggar in Tibetan
Gongjue	County name in Chinese Pinyin; Gongjo in Tibetan
Gyangtse town	Tibetan; Jiangzi town in Chinese Pinyin
Han	The main Chinese nationality
Henan	A province of China
Hengduan	Name of a mountain
Hor	Tibetan name for people from Nagchu (Naqu) in northern Tibet
Hui	Chinese word for Moslem
Jiali	County name in Chinese Pinyin; Chali in Tibetan
Jiangda	County name in Chinese Pinyin; Gyamda in Tibetan
Jiangzi	County name in Chinese Pinyin; Gyantse in Tibetan
Jiazha	County name in Chinese Pinyin; Gyatsa in Tibetan
Jilong	County name in Chinese Pinyin; Kyirong in Tibetan
Jinshajiang	Name of a river
Jue	Tibetan word for safety and nutrition
Kangma	County name in Chinese Pinyin; Khangmar in Tibetan
Khampa	Tibetan for people from Chamdo
Kulun	Name of a mountain
Lancang Jiang	Name of a river
Langkazi	County name in Chinese Pinyin; Nakartse in Tibetan
Lazi	County name in Chinese Pinyin; Lhatse in Tibetan
Leiwuqi	County name in Chinese Pinyin; Rioche in Tibetan
Lhasa	County name in both Chinese Pinyin and in Tibetan
Lhasa	A prefecture; also the capital city in Tibet Autonomous Region.
Lhoba	A minority group in Tibet
Linshi	County name in Chinese Pinyin; Nyingtri in Tibetan
Linshi	A prefecture in Tibet Autonomous Region; Lhoka in Tibetan
Linzhou	County name in Chinese Pinyin; Lhundup in Tibetan
Lisu	A minority group in Tibet
Longzi	County name in Chinese Pinyin; Lhuntse in Tibetan
Luolong	County name in Chinese Pinyin; Lhorong in Tibetan
Luozha	County name in Chinese Pinyin; Lhodak in Tibetan
Man	A minority group in Tibet
Mangkang	County name in Chinese Pinyin; Markham in Tibetan
Mengarbu	White medicine (Tibetan)
Miao	A minority group in Tibet
Milin	County name in Chinese Pinyin; Miling in Tibetan
Monba	A minority group in Tibet
Mongolian	A minority group in Tibet
Mozhugongka	County name in Chinese Pinyin; Medro Gongkar in Tibetan
Muotuo	County name in Chinese Pinyin; Metok in Tibetan
Naidong	County name in Chinese Pinyin; Nedong in Tibetan
Nanmulin	County name in Chinese Pinyin; Namling in Tibetan
Naqu	County name in Chinese Pinyin; Nakchu in Tibetan
Naqu	A prefecture in Tibet Autonomous Region; Nakchu in Tibetan
Nashi	A minority group in Tibet
Nianqingtangula	Name of a mountain

Nielamu	County name in Chinese Pinyin; Nyalam in Tibetan
Nierong	County name in Chinese Pinyin; Nyerong in Tibetan
Nima	County name in Chinese Pinyin; Nyima in Tibetan
Nimu	County name in Chinese Pinyin; Nyemo in Tibetan
Nu	A minority group in Tibet
Nujiang	Name of a river
Nyachu	Name of a river
Pulan	County name in Chinese Pinyin; Purang in Tibetan
Qinghai	A province of China
Qiongjie	County name in Chinese Pinyin; Chong-Gye in Tibetan
Qushui	County name in Chinese Pinyin; Chushur in Tibetan
Qusong	County name in Chinese Pinyin; Chosum in Tibetan
Renbu	County name in Chinese Pinyin; Rinpung in Tibetan
Rikaze	County name in Chinese Pinyin; Shigatse in Tibetan
Ritu	County name in Chinese Pinyin; Rutok in Tibetan
Saga	County name in Chinese Pinyin; Saga in Tibetan
Sajia	County name in Chinese Pinyin; Sakya in Tibetan
Samadrog	Tibetan word for farmers practising both cropping and animal husbandry
Sangri	County name in Chinese Pinyin; Sangri in Tibetan
Shannan	A prefecture in Tibet Autonomous Region; Lhoka in Tibetan
Shenzha	County name in Chinese Pinyin; Shantsa in Tibetan
Sherba	A minority group in Tibet
Shigatse	A prefecture in Tibet Autonomous Region
Shingba	Cropping farmers (Tibetan)
Shuanghu Admin. Office	A county-level special office for managing the Shuanghu area in northern Tibet
Sichuan	A province of China
Suoxian	County name in Chinese Pinyin; Sokshan in Tibetan
Tanggula	Name of a mountain
Tsampa	Tibetan word for roasted barley flour
Tsangba	Tibetan word for people from the Shigatse region
Tu	A minority group in Tibet
Uhba	Tibetan word for people from the regions of Lhasa and Shannan Prefecture
Uygur	A minority group in Tibet
Xietongmen	County name in Chinese Pinyin; Tongmon in Tibetan
Xinjiang	Xinjiang Uygur Autonomous Region of China
Yadong	County name in Chinese Pinyin; Chomo in Tibetan
Yalong valley	A valley in central Tibet
Yalongtsangpo River	Tibetan word for Brahmaputra River
Yi	A minority group in Tibet
Yunnan	A province of China
Zedang town	Chinese Pinyin; Tsetang town in Tibetan
Zha'nang	County name in Chinese Pinyin; Dranang in Tibetan
Zhada	County name in Chinese Pinyin; Tsada in Tibetan
Zhongba	County name in Chinese Pinyin; Dengpa in Tibetan
Zhuang	A minority group in Tibet
zo	Crossbreed of yak and cow
Zuogong	County name in Chinese Pinyin; Zogong in Tibetan

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