

41. Introduce a Training of Trainers' (TOT) system to improve the qualifications of government officials at various levels.
42. Develop an effective monitoring system comprised of relevant indicators for measuring poverty and for measuring the development process.

BEYOND THE CONFERENCE

The conference proved to be timely and was much appreciated by the TAR Government. It provided a platform for taking stock of the progress made in socioeconomic development of the region, to share valuable experiences from within China and among neighbouring countries, and to assess the current trends and emerging challenges posed by globalisation of trade and climate change to its economy and its environment. The participants from the TAR and other parts of China showed high levels of commitment to alleviating poverty and conserving the nature and culture of this unique region. There were serious concerns expressed about the region's culture, economy, and environment, but these were far outweighed by the messages of hope, aspiration, and potential for a bright future. The development agencies and NGOs working in the region pledged their commitment to strengthening their efforts to bring peace, prosperity, and happiness to the people of the TAR. The representatives of the organising agencies, TAAAS, TAR; InWEnt, Germany; ICIMOD, Nepal; and EU, Beijing, reiterated their agenda to take forward the recommendations from the conference and proposed the establishment of a Mountain Development Partnership for this purpose.

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Chapter 2

Perception, Assessment and Indicators of Poverty and Food Security from the Perspective of the Panam Integrated Rural Development Project

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INTRODUCTION

This paper commences with basic information about Panam County, Shigatse Prefecture, Tibet Autonomous Region, and goes on to discuss the poverty in Panam County and outlines the major poverty-alleviating policies of the government. The paper then presents the Panam Integrated Rural Development Project (PIRDP), its background, concept, and the current status of the project's implementation. It provides a summary of PIRDP's major contributions towards poverty alleviation and outlines how the momentum could be maintained after the termination of the project in December 2005. Finally, it proposes future options for poverty alleviation and improving standards of living in Panam County.

Basic information on Panam County

Panam County is located in the south-central part of Shigatse Prefecture of the Tibet Autonomous Region (TAR). Panam County, extending 121 km from north to south and 20 km from east to west, covers a total area of 2,759sq.km. and is one of the smallest of the 18 counties of Shigatse Prefecture. The exact geographical location is north latitude 28° 17'-29° 19' and east longitude 88° 15'-89° 27'. The average altitude of Panam County is above 4,000 m, increases towards the south, and reaches its highest elevation on the south-western border with Sajia county, Sang Qi Ri Mountain at 6,131 masl. Panam County is dissected by numerous valleys and rivers, of which the Nyachu, Dongxi, and Chu Sun rivers are the most important ones. Lying along the road to

Yadong and India, Panam town is easily accessible. Being 49 and 43 km. respectively from Shigatse and Gyantse, Panam is in between these two most important places of Shigatse Prefecture.

With about 95% of Panam County's area comprising of mountains and only five per cent fertile valleys, Panam County is clearly a mountainous county. The arable area of Panam County is 12,230 ha, with a total cropped area of 8,493 ha¹. The average farm is in the range of one to two hectares. Panam County has 149,560 ha of pastures, of which 102,920 ha are used. The county has also considerable mineral deposits, in particular copper, phosphate, lead, zinc, and chromium, as well as geothermal energy.

Panam County's semi-arid climate is characterised by strong solar radiation and approximately 3,200 hours of annual sunshine, an average annual temperature of 5.9°C, 120-140 frost-free days, four distinct seasons, and an average annual precipitation of 412 mm falling mainly from the end of May to the end of September².

Administratively, Panam County has two towns (Luojiang and Jiaodong) nine townships (Dongxi, Zhexia, Gapu, Wangdan, Ma, Qumu, Duqiong, Qiangdui, and Baza), and 114 administrative villages, of which 13 are pure nomadic villages. At the end of 2003, Panam County had a total of 6,060 households and a population of 42,559; of these roughly 90% depended for their livelihood on agriculture, about nine per cent were livestock herders, and less than one per cent were earning their living from non-agricultural activities.

Literacy and school enrollment

The illiteracy rate, especially among the older people, is high. The official school enrollment rate is 90%, and the average drop-out rate for the whole county is 11.3%.

The health situation in Panam County is improving, however, in villages of remote townships there is a general lack of health services and poor hygienic standards.

¹ The total arable and cropped area cover 4.4 and 3.1% of Panam County's total area, with an average of 0.20 ha area cropped per person; however, the total cropped area of Panam County consists of 10.5% of the total cropland area of 80,580 ha of Shigatse Prefecture.

² The annual precipitation ranges from 200 to 700 mm and the average air humidity is 41%; the global radiation ranges from 7 -9 KW per m² on days with sunshine, and the average wind speeds of 158 km for Shigatse and Gyantse.

Profile of poverty in Panam County

Major causes of poverty in Panam County

The extreme geographic and climatic conditions of Panam result in only four to five months' growing conditions and highly vulnerable ecosystems, thus limiting the productivity of production factors in comparison to other lower lying areas of China. Low levels of education and investment in infrastructure; poor accessibility; limited local products of market value; poor nutritional, health and hygiene standards; a relatively fast-growing population; and a high level of risk aversion towards innovation and change are the major social and economic factors contributing to the current levels of poverty in Panam County.

The extent of poverty is a result of insignificant levels of grain production, particularly in the predominantly herder townships of Dongxi, Gapu, and Zhexia; while the townships of Baza, Jiadong, and Luojiang located in the Nyachu Valley, where the farmland is very fertile and irrigated, are the richest townships in Panam County. In comparative terms, given that its irrigated cropping area is large and fertile, Panam County is one of the richest counties in both Shigatse Prefecture and in the TAR; in 2003, the average cash income per person was 1,980 RMB.

Changes in poverty levels from 1994 to 1998

According to government statistics, at the end of 1994³, Panam County had 996 poor households with a population of 6,106, equivalent to 19.2% of the total households and 15.4% of the total population. Annual cash income and average grain production from all the poor households averaged 386 RMB and 258 kg (516 jin) per person.

As a result of the government interventions taken between 1994 and 1998; e.g., poverty alleviation programmes ameliorating existing and opening up new agricultural land of 820 ha (12,309 mu) and improving the housing conditions of farmers and herders⁴, the average income rose to 729 RMB by 1998 and average grain production increased to 380 kg (760 jin/capita) per person, an increase of 343 RMB and 122 kg (244 jin) per capita over 1994. During the same period, average livestock

³ In 1994, the poverty line was based mainly on the cash income and grain production required for meeting a minimum daily nutritional intake. The actual benchmarks defining the poverty line increased over the years from about 200 kg of grain to now 400 kg of grain per person and from cash income as low as RMB 200 to RMB 1,000 around 1998.

⁴ According to government information, 293 standard living rooms were rebuilt for farming and herding households.

holdings per person increased slightly by 0.04 to 8.04 sheep units⁵; average farmland area could be expanded to two mu per person (an increase of 0.48 mu as compared to 1994); and the average floor space per person had reached 15 m² (increased by 5.42 m²). According to the statistics, by the end of 1998, all 996 households and 6,106 people had moved above the poverty line as determined at that time.

Current levels of poverty in Panam County

Panam County set the new poverty line at 1,300 RMB in cash income and 400 kg of grain produced per person and year. At the end of 2002, and based on cash income, a total of 3,882 households and 25,469 people living in 71 villages fell below the poverty line of 1,300 RMB (Table 1). Expressed differently, 62.3% of all villages, 78.5% of all households, and 67% of the total population of Panam County had an annual cash income lower than 1,300 RMB by the end of 2002.

The eight indicators are: (1) average cash income per person per year, (2) average grain production per person per year, (3) percentage of households living in poor housing (meaning non-brick), (4) percentage of households with access to potable water within 1 km or 1 hour, (5) percentage of households with access to reliable electricity, (6) percentage of natural villages with no access to an all weather road, (7) percentage of children dropping out of primary and middle school, (8) percentage of women with a health problem.

These indicators can be grouped into three categories of livelihood (indicators 1 to 3), infrastructure (4 to 6), and human resources (7 and 8) and were chosen from a potential list of forty-one possibilities during field testing of the methodology. A perceived advantage of the final list of indicators is that all six new factors (that is, the latter two categories) are expressed as a simple proportion of households in a given village, and are thus easy to assess and review.

⁵ One Sheep Unit (SU) is a simple method for calculating a comparative figure for the different forms of livestock and the carrying capacity of grassland. The SU is based on the amount of forage/grass different forms of livestock need per annum. The SU may differ from place to place. Generally, 1 sheep/goat equals 1 SU; 1 pig equals 2.5 SU; 1 big animal [including horses, yaks, cattle, cows, donkeys and mules] equals 5 SU.

Table 1: Total population of Panam County below the poverty line based on cash income (end of 2002)

Annual Cash Income/Capita (RMB):	Households		Population	
	Number	Percent	Number	Percent
300 – 700 RMB	398	7.3	2,536	6.1
701 – 1,300 RMB	3,882	71.2	25,469	60.9
- Annual cash income below 1,300 RMB:	4,280	78.5	28,005	67.0
- Annual cash income 1,301 RMB and above	1,174	21.5	13,793	33.0

Note: Data are derived from the 'Eleventh Five-year Poverty Reduction Plan of Panam County', issued by the Panam County government on 2004 April 1.

Policies and programmes aimed at reducing poverty in Panam County

Major government programmes

In 2001, the government adopted the 'China Rural Poverty Reduction and Development Programme 2001 – 2010', in which a total of 592 counties out of 2,200 counties in the whole of China were included and 74 counties of the TAR have been added as 'Key Poverty Alleviation Counties'. About 85% of the counties selected for the programme are mountainous counties, clearly indicating that poverty is highly correlated with mountainous topography. In early 2003, the Chinese government adopted the new County Poverty Alleviation Planning Methodology (CPAPM), which replaced the previous two poverty indicators and replaced them with a set of eight poverty indicators to factor in human development and social-environmental considerations.

One of the future government plans is to develop Panam and Gyantse counties and Shigatse city as models for modernising agriculture in Tibet. Government measures aim to develop agriculture and livestock based on market needs with farmers and herders as the main beneficiaries. Macro interventions in infrastructure, e.g., road building and provision of electricity and drinking water, are combined with micro measures aimed at benefiting selected individual households directly. Poverty alleviation measures are to contribute towards capacity building and the improved and sustainable use of natural resources. The government's focal areas of poverty alleviation measures are, in particular, expanding the irrigated areas and increasing the efficiency of water use in existing irrigation schemes; developing crop production; building up capacities of the main beneficiaries participating in and contributing to the development process at all levels; and developing the locations identified for future development activities.

Since 1994, as part of the 'National 8.7 Poverty Reduction Plan'⁶, Panam County government has pursued major poverty alleviation measures/strategies including: (i) identification of the causes of poverty; (ii) development of poverty alleviation strategies; (iii) establishment of Poverty Alleviation Leading Groups and development of implementation plans, (iv) implementation of a system of personal and direct responsibility; (v) promotion of education, health, and technology; and (vi) strengthening of capacities to alleviate poverty at the grass roots' level.

According to the Panam County government, resettling poor households to areas with better potential for economic development is an important policy for directly reducing cases of extreme poverty in extremely vulnerable areas. In general, these households live in the herder areas of Dongxi, Zhexia, and Gapu townships and are relocated to lower-lying and, if possible, irrigated farmland within the same township: and, in extreme cases, to villages in the Nyachu Valley. This policy started in 1994. In 2003, 25 households were resettled to nearby villages, while in 2004 some 80-90 households are to be relocated to newly-developed areas.

Currently the Panam County government is preparing the following three poverty alleviation projects for implementation: 'infrastructure development for planting and irrigating pasture areas in Dongxi River Valley'; extending the irrigation capacity in Shangba village, Wangdan Township; and promoting greenhouse production of vegetables in Wangdan and Ma townships.

The major poverty alleviating measures planned for the five-year Plan 2006-2010⁷ may include some of the measures being planned by the TAR government as part of the development of Panam and Gyantse counties and Shigatse city—the model for modernising agriculture in the TAR.

To improve the effectiveness of poverty-alleviating projects and measures, Panam County government has assigned the direct responsibility for reducing poverty in a given township and/or village to selected government bureaux and civil servants⁸. The beneficiaries at township and

⁶ From 1994 to 2000, the Chinese government implemented the 'National 8.7 Poverty Reduction Plan'; due to scarce data, information on poverty reduction measures is for the time being given only for the period 1994 to 1998.

⁷ This information is not available for Panam County's current 5-year plan 2001 to 2005.

⁸ In 2004, these responsibilities were assigned to the following officials: Dongxi township: Mr. Zhandu, Director of the People's Congress of PC; Zhexia township: Mr. Luo Dan, Vice Director of the People's Congress; Gapu: Wangdan township: Mr. Pubu, Vice Governor PC; Mr. Ren Jifan, Vice Governor PC, and Mr. Suolang Jianzhen, Director of the People's Court; Ma township: Mr. Pengchu, Vice Governor Panam County; Mr. Qumu- Duqiong township: Mr. Tong Dawa, Vice Governor PC; Qiangdui township: Mr. Tsering Ouchu, Vice Governor PC; Luojiang township: Mr. Sunbo, Vice Party Secretary PC; Baza township: Mr. Zhang, Vice Party Secretary PC; Jiadong: Mr. Zhawang, Vice Governor PC.

village level are cooperating with the various government bureaux and officials through the local cadres on the township and village committees and mass organisations such as the women's federation. Grass-roots' organisations do not exist in Tibet.

The funds needed are provided directly by the central and TAR government, and also through partnership arrangements with rich eastern provinces, prefectures, and counties. Since 1998, Shandong province has had a twin arrangement with Panam County. Jinan city in Shandong province is providing funds and technical expertise to improve the infrastructure and capacities of Panam town and county. One programme in particular is the support Shandong province is giving to expand vegetable production by funding the construction of 450 mu (30 ha) of greenhouses.

Panam Integrated Rural Development Project (PIRDP)

Project genesis and start-up

Planning of the EU-China Panam Integrated Rural Development Project (PIRDP) began in 1992, largely as a result of political considerations, and stretched over a period of nearly nine years. Initially, PIRDP was conceived as an irrigation project with the immediate objective of improving the efficiency of usage of the Chu Sun Irrigation system, and thus contributing towards improving the income and livelihoods of the people within the irrigation perimeter. In consecutive years and planning steps, components were added, in particular, agriculture, livestock, and forestry and rural water supply and sanitation, education, health, and finally rural credit and capacity building. The Chinese side began constructing the Chu Sun dam and irrigation canals in 1997. By 1999, the Chinese government had completed the dam and eight secondary earthen canals plus basic irrigation works over a total length of 42 km for a total investment of around 14.2 million US\$.

The Financing Agreement (FA) of PIRDP was signed in 1998, covering the five-year period from January 1998 to 31st December 2002. PIRDP's total European and Chinese budgets are € 7,600,000 and € 2,231,390, respectively⁹.

Joint project implementation started in June 2001 with the arrival of European technical assistance. In the second half of 2001, the project team drafted the Inception Report with the Overall Work Plan and Budget. As the Work Plan and Budget 2002 was approved only in June 2002;

⁹ The exchange rate € : CNY used in budgetary calculations is 1 : 7.26, i.e., the exchange rate of December 2002, the time of signing Addendum No. 1 to the Financing Agreement.

and with restricted tendering due to the limited time period of the FA, the implementation of most project activities was considerably delayed. In early 2003, the severe acute respiratory syndrome (SARS) crisis delayed further project implementation, more particularly in health as a result of the delayed arrival of the health advisory team. In general, strict EU standard tendering procedures and regulations resulted in delaying the procurement of all major equipment and services considerably.

By the end of 2002, only 19.4% of the CEU funds had been spent, while, in 2003, a further 37.2% of the funds were spent, bringing the total spending to 56.6% of the total CEU budget. Until the end of 2003, the Chinese side had spent 16.2% of its total budget. In 2002, the FA was extended until 2005 December 31, when the project will end after less than four years of implementation.

Objectives and areas of intervention

A project planning workshop was held in July 2003 in which the major stakeholders of the project formulated the objectives of PIRDP as contained in its current logframe. The overall goal, project purpose, and major results are as follow.

The Overall Objective is stated as: *"The quality of human development and living standards of the Tibetan people of Shigatse Prefecture are improved in a sustainable and replicable way"*, while the Project Purpose is formulated as *"A sustainable and replicable model for improving the quality of human development of the people of Panam County is developed"*. To stress the importance of integration, only one main result was formulated under the components related to farming systems, i.e., irrigation, agriculture/crops, livestock, and extension cum rural credit and for the components related to social services, i.e., rural water supply and sanitation, education, and health.

The *Main Result 1* for the farming systems' components is *"Through capacity building and the introduction of new crops, breeds, technologies and infrastructure on a pilot basis, the major farming systems of Panam County will have become more sustainable, productive and profitable, and will continue to do[be] so"*. The *Main Result 2* for the social services' components is *"Through capacity building and the provision of basic social services, the human capacities and capabilities and future prospects of rural Tibetans of Panam County [will] have improved"*.

The TAR government has selected Panam and Gyantse counties and Shigatse City as the three model areas for modernising agriculture in

Tibet. As such, PIRDP is strategically in a most relevant position for the models derived from its work to be replicated not only in other counties of Shigatse Prefecture but also in other prefectures of the TAR.

Project area

The project area includes all townships of Panam County the social service components: education, health, and, to a lesser extent, rural water supply and sanitation (RWSS). Irrigation, agriculture, livestock, and extension concentrate their activities on the townships of Wangdan, Ma, Qumu, DuQiong, Luojiang, Baza, and Jiadong. Two of the three pilot villages are located in Ma township (Tugu and Puxi), and one pilot village is located in Jiadong township (Baixue).

Beneficiaries

The direct beneficiaries of PIRDP are the rural Tibetan households of Panam County, while the indirect beneficiaries are the staff members of the implementing line agencies PIRDP is cooperating with¹⁰.

As with the target area, the direct beneficiaries differ among the project components. Education concentrates its activities directly in improving the teaching methods of 150 of a total of 250 teachers at the 12 Integrated Primary Schools (IPS), and around 3,400 (65%) of the total of 5,300 pupils are benefiting.

Health aims at improving the health of mothers and infants, and on improving hygienic and sanitary conditions in clinics, schools, and selected villages: the potential number of beneficiaries is close to the total population of Panam County. Rural Water Supply and Sanitation (RWSS) provides clean drinking water through gravity pipeline water systems (GPL) and through hand pumps in 25 selected villages and in another 40 villages, including some 20 schools and 15 clinics in these villages; in 11 townships a total of approximately 24,000 people (56% of the total population of Panam County) are benefiting from clean drinking water. In comparison, the number of direct beneficiaries from irrigation, agriculture, and livestock are smaller. The relined canals will serve an irrigated area of 1,177 ha benefiting 660 households and 4,786 persons in 15 villages of four townships¹¹. Agriculture and Livestock deal with some 50 village crop technicians and 30 village veterinary technicians and reach directly a total of around 500 and 300 selected farm households in the townships mentioned above.

¹⁰ See paragraph that follows and para under 'Implementing agencies'.

¹¹ The gross area within the Chu Sun irrigation perimeter is about 3,200 ha.

Implementing agencies

The Ministry of Commerce (MOFCOM) at the national level and the Department of Commerce (DOFCOM) at the regional/TAR and prefecture levels are the main counterparts. At county level, the following line agencies implement the different project components: the Panam County Water Resources Bureau (PCWRB), for irrigation and rural water supply, the Panam County Bureau of Agriculture and Livestock (PCBAL), agriculture, livestock, and extension components, the Panam County Education Bureau (PCEB) and the Panam County Health Bureau (PCHB). On behalf of the European Commission, the German consulting company Agrar and Hydrotechnik (AHT) Group, the London-based Save the Children(SC)-UK, and the Rome based INGO Association for International Solidarity in Asia (ASIA) have been contracted to implement the components in irrigation, agriculture, livestock, extension, and rural credit plus overall project management, education, and health.

Current status and potential impact on reducing poverty

Project concept: Since 2003, the project stakeholders have gradually recognised the lack of readily available energy, resulting in the burning of cow dung as a major cause for land degradation, low or declining productivity, and ultimately as one of the main causes of poverty and poor living conditions in Panam County. It was decided that the remaining project duration would be best used by starting to develop an integrated crop, livestock, and forestry model (ICLFM) for sustainable and productive use of Panam County's natural resources; and at the same time continuing to improve the health and education of the people of Panam. To succeed in developing and adopting the ICLFM, the following major conditions had to be met: economic and affordable alternative fuel source(s) must exist and must be made available; farmers must have sufficient economic incentives for substituting barley with forage production¹²; and the institutions involved must have a long-term commitment towards strengthening the research and extension system and upgrading and training the extension staff. To make ICLFM effective and sustainable, major efforts are being undertaken to carry out activities in a participatory manner and coordinate crop and livestock-related extension activities and integrate them into the Panam County Bureau of Agriculture and Livestock through joint planning, training, and implementation and follow-up activities. The extension staff at county level and the staff seconded from the TAAAS work with farmers were organised into Farmer Technical Interest Groups (FTIG). To this end, the

¹² Intensifying dairy production is considered to be the most promising option for earning additional cash income from intensifying livestock production.

Project Management Office (PMO), Panam county government, and TAAAS are working towards establishing close and long-term cooperation between the main stakeholders and integrating project activities into the government programmes of Panam County and the Tibetan Academy of Agricultural and Animal Husbandry Sciences (TAAAS). Furthermore, PIRDP recognised the need for piloting the integration of activities and services of the different government institutions in selected villages and townships. Through geographical integration in the three pilot villages, the stakeholders of the different project components cooperate and contribute towards formulating, implementing and monitoring the village action plan (VAP) and the village development plan (VDP) at pilot village level. As such, institutional and geographical integration supplement each other. The social project components Rural Water Supply, Education and Health pursue a similar integrated institutional approach to improve the basic health and sanitary conditions.

Extension

The extension system, which is still in the process of being set up, consists of: the Tibetan Academy of Agricultural and Animal Husbandry Sciences (TAAAS) which will generate and provide the technical information and training; the extension staff of the Panam County Bureau of Agriculture and Livestock (PCBAL); the Village Crop Technicians (VCT) and Village Veterinary Technicians (VVT) as village-level extension agents; and the farmers organised into Farmers' Technical Interest Groups (FTIG). To increase efficiency in water use, farmers will also be organised at village level into Water User Groups. After the termination of PIRDP, the extension staff of PCBAL will have acquired sufficient knowledge and skills to plan and implement extension work successfully, mainly based on group extension.

To continue the activities initiated by PIRDP after 2005, close cooperation and a close working relationship are being established with the agricultural research and extension system of TAR, in particular with TAAAS. TAAAS is seconding five of its staff members in agriculture, horticulture, and livestock to the Baxue Agricultural Experiment and Extension Station (BAEES) to work permanently with the technical assistant (TA) in agriculture and train the staff of the PCBAL. The Baxue Agricultural Experiment and Extension Station will become the research and testing site for TAAAS in Shigatse Prefecture. In future, more attention must be paid to the economics and the marketing of different crop varieties and management techniques.

Due to lack of staff capacity, little progress has been made so far with regard to integrating the Agricultural Bank of China (ABC) into the

extension system to enable the ABC to provide tailor-made production loans for profitable farm enterprises and activities.

Pilot villages: In the second half of 2003 the project team selected three representative pilot villages within the project area; Tugu and Puxi in Ma Township and Baxue in Jiadong Township. The major objectives are to support the government in its poverty alleviation and development efforts by demonstrating capacity building at village and institutional level and participatory integrated village development for future replication at county and prefecture level.

In November 2003 and under the guidance of a team of three experts from the Centre for Integrated Agricultural Development (CIAD) in Beijing, staff from PIRD and from all cooperating Panam County bureaux carried out participatory rural appraisal (PRA) jointly with villagers in three pilot villages and developed annual village action plans (VAP) and medium-term village development plans (VDP) for 2004¹³. As part of the village planning, villagers identified and prioritised areas of development in the fields of infrastructure, agriculture, livestock, forestry, health, education and income-generating activities, named the main activities, assigned responsibilities, and estimated the material inputs and funds required¹⁴.

In early 2004, the three villages established an organisational structure for implementing the VAP and VDP by establishing Village Coordination and Monitoring Teams (VCMT) and Farmers' Technical Interest groups. The membership of the VCMT is comprised of the Village Leader and the Party Secretary plus the leaders of all FTIGs. Decision-making is by consensus. The VCMT meets regularly on a fortnightly basis or as need arises.

By July 2004, FTIGs had been set up for different purposes in all three pilot villages.

In setting up the organisational structure and in implementing the VAP, the members of the VCMT and the FTIGs are supported by the Project Coordinator based at Panam, while FTIGs are regularly visited by crop, livestock, and forestry extension staff from the PCBAL, and by members from the project's Rural Water Supply and Health teams. All three pilot villages have already completed or are in the process of setting up small village centres for holding meetings; one room of the village centre serves as a village clinic.

¹³ The methodology followed the County Poverty Alleviation Planning Methodology for the most part.

¹⁴ The budgets calculated for implementing the VAP are as follows: Tugu RMB 390,000; Puxi RMB 235,000; and Baxue RMB 200,000.

Until July 2004, the main activities have consisted of planting and managing tree seedlings and of new varieties of food and forage crops; the provision of solar stoves at 50% of cost; and the use of agricultural machinery for land preparation. To make better use of the solar stoves, provision of more thermos flasks and pressure cookers is planned at subsidised cost. Storing larger quantities of hot water will help improve hygiene, while pressure cookers will allow the efficient preparation of new food and dishes and save on fuel. Promotion of hygiene and sanitation started in early 2004 as a continuous activity.

Agriculture and crop extension: The immediate objectives of the agricultural component are the testing, selection, and introduction of new crops and varieties with higher yields and better nutritional values for both humans and livestock (e.g., wheat, triticale, rye, potatoes, oats, beets, alfalfa) (Table 2) in order to improve, directly and indirectly, the nutrition and health of the rural population in and outside of Panam County. Together with new crops and varieties, improved agronomic cultivation and management techniques are also being tested and introduced (Table 3). As such, the agricultural component addresses directly the still widespread and high levels of malnutrition and under nutrition, particularly in children living in remote areas.

Since autumn 2001, testing of new varieties and crops has mainly been carried out on-station at the Baxue Agricultural Experiment and Extension Station (BAEES) under the leadership of the TA of agriculture. New winter wheat, barley, and rape seed varieties, as well as potatoes, sugar and fodder beets, and a multitude of different forage crops of various origins (e.g., maize, alfalfa) have been tested for yield and nutritional contents. Due to the high solar radiation and the low night temperatures, the results (yield, starch, sugar, and oil contents) of most crops tested are very encouraging. For example, the best varieties of winter wheat, winter triticale, and winter rye reach yields of up to 10 t/ha, spring triticale up to 8 t/ha, fodder beets up to 100 t, and sugar beets up to 70 t/ha.

In 2003, the most promising crops and varieties were tested on-farm for the first time in Duqiong, Qumu, Jiadong, and Luojiang townships. In 2004, the agricultural component and the Crop Extension Section of PCBAL expanded on-farm testing by involving farmers and Village Crop Technicians and by setting up FTIGs for testing the different crops. By July 2004, 263 farmer households in 72 villages of 11 townships had been carrying out on-farm testing of 12.2t planting materials (mainly potatoes, rapeseed, sugar and fodder beets, oats, and a mixture of different forage crops of grasses and legumes) directly on 62ha (930mu). Forage seeds

and planting materials have been given preferentially to member farmers of FTIGs who are cross-breeding Jersey with local cattle. These farmers receive formal training at BAEES at the beginning of the growing season, at mid-season, and before harvest. Between these training courses, the agricultural team follows up and assists farmers and compiles the most essential data.

Potential food and forage crops and agronomic practices as a result of PIRDP's work and recommended for further research and extension beyond 2005

Table 2: Food and forage crops

Crop	Justification and impact	Potential yield/ha	HC, LS*
Various winter and spring wheat varieties	Higher yield and improved baking quality	8t/6t	HC
Various winter and spring triticale varieties	Suitable for human consumption, has high, -amylase content	9t/7t	HC, LS
Oats	Primary fodder grain and for forage as hay or silage	30t fresh leaf weight	LS
Various winter and spring rye varieties	excellent environmental adaptation to high altitude; high grain and fodder yield (green fodder and hay)	40t fresh leaf weight	LS
Maize	For making silage from the whole plant	40-50t fresh weight	LS
Alfalfa	High protein content; plant nitrogen fixing and improving soil	60t fresh weight	LS
Sugar/fodder beets	Feeding livestock; high yields and nutritional contents	70/100 t beets 30/40t leaves	LS, HC
Potatoes	High and most balanced nutrient contents (starch, nitrogen compounds, organic acids, minerals and enzymes); ideal for human consumption	40t	HC, LS
Rape seed	Main source of edible oil in Tibet; new varieties higher yielding and without aruca acid	2.5 t when planted as single crop	HC

*: HC = Human Consumption; LS = Livestock Feeding

To address the lack of forage, particularly in winter, in 2004 the agricultural team started two development activities which, if successful, could have a significant impact on livestock raising and on the livelihood of farmers and herders. As part of the development activities in three pilot villages, a mixture of different forage crops has been planted on 16.7 ha (250 mu) of colluvial wasteland¹⁵; and, in the herder township of Dongxi, winter

¹⁵ The forage mixture planted per ha is comprised of the following species: *Onobrychis vicunifolia* (25 kg), *Medicago sativa/alfalfa* (8 kg), *Melilotus albus/white sweet clover* (6 kg), and *Lolium perenne/perennial rye grass* (6 kg).

Table 3: Improved Agronomic Methods and Practices

Methods and practices*	Justification and impact	Expected effect on yield
Cultivating single rows of potatoes on ridges	Planting potatoes 25-30 cm apart on single ridges with 60 cm spacing, yield may increase up to threefold over traditional planting method. Traditionally, farmers in PC grow potatoes on wide ridges (80cm wide x 50cm high) with seed potatoes planted randomly and very narrowly, resulting in small tubers and low yield (while labour input for weeding is reduced and potatoes are less affected by drought).	Up to threefold increase in yield
Rape seed	Grow rape as a single crop, with 40cm between and 15-20cm in the row, and apply 7kg N/ha; prior to sowing, harrow field 3-4 times. Traditionally, farmers in PC crop rape with barley with very low yield, partly because of asynchronous ripening leading to shattering and large losses of rape seed; this practice contaminates the fields and for many years rape becomes a weed.	Up to threefold increase in yield
Beets	Successful cultivation of beets need special crop management: directly before sowing irrigate field; soak seeds; cover soil with plastic mulch; every 15 cm, make holes into the plastic mulch and plant at 1-2cm depth 3-4 pre-soaked seed kernels per hole; at the 3-4 leaves' stage, select the strongest plantlet and to prevent weeds from growing, cover the mulch with soil. Apply NP fertilizer twice(150kg N and x kg P ₂ O ₅ , equal to 10 kg N and y kg P ₂ O ₅ per mu).	Beets can be grown success-fully only under (plastic) mulch
Maize and sunflowers	Cover soil with plastic mulch; every 20 cm, make holes in the plastic mulch and plant at 1-2cm depth 3-4 seed kernels per hole; when plants are 15-20cm tall, select the strongest 2-3 plantlets; to prevent weeds from growing, cover the mulch with soil.	Maize and sunflowers can be grown most success-fully under (plastic) mulch

spring rye, oats, and spring triticale have been planted for harvesting at milking stage and have been made either into hay and/or silage.

Livestock extension: The livestock activities focus on increasing the productivity of major livestock such as cattle, goats, and chickens, the income from livestock keeping, and the nutritional status and health of farmers and herders. The major activities which the livestock component started in 2002 were the cross-breeding, through artificial insemination with Jersey semen of local cattle from Guangdong Province; improving the management and feeding of calves; the introduction of a new breed of chicken (Lhasa White) for egg production as an income-generating activity; and the introduction of male Cashmere goats, initially for cross-breeding with local goats, in one herder township (Dongxi) and, if successful, of breeding pure Cashmere goats (Table 4).

As of now, 11 FTIGs with a total of about 180, mainly better-off, farmer households in four townships and seven villages are participating and directly benefiting from the Jersey cross-breeding programme. Specific objectives of this cross-breeding programme are to increase the production of milk and butter, in particular, and to reduce problems, encountered when large exotic breeds such as Black and White and Simmental are introduced, through artificial insemination (AI). Fifteen village veterinarians have been trained in AI; this training benefits their work in the AI programmes with Black and White and Simmental.

To produce the larger quantities of feed and forage the cross-breeds need, and to practise the integration of livestock into crop production, in 2004 the members of the FTIGs breeding Jerseys received oat and forage seeds (mixtures of alfalfa with other legumes and grasses) and sugar and fodder beets. Follow-up is jointly carried out between crop and livestock extension.

Improved livestock husbandry methods and practices recommended for further research and extension beyond 2005

Table 4: Livestock Improvement Activities

Methods and practices	Justification and expected impact
Cross breeding Jersey with local cattle	Jersey cows are similar in size to local cows and cross-breeding does not cause complications, especially at birth; the female-male ratio of calves is higher than for all other cattle breeds in Panam County; the fat content of milk is expected to be very high; very suitable for selling milk
Promoting Lhasa Whites for egg production	Laying of 200-220 eggs per hen and cycle; improves protein supply, nutritional status, and health of the people
Forage production	Directly, forage production will improve nutritional status and growth of livestock and, hence, the production of milk and meat; indirectly, the nutritional status and health as well as the income and livelihood of the people will improve.

The objectives of the Cashmere cross-breeding programme are to improve the quality of the wool of the off-spring from male Cashmere and local female goats; to increase the price the farmer/herder gets for the wool; and, by this, to increase the income and improve the livelihood of herders. Introducing Cashmere goats to Dongxi Township benefits equally all households in this township. If the initial experience gained this year is sufficiently positive, the purchase of female Cashmere goats in Naqu County and their introduction to Dongxi Township and possibly Zhaxia Township are planned for 2005.

The objectives of promoting Lhasa Whites are to provide additional protein and to improve the nutritional status and the income of families through egg production. In addition, promoting Lhasa Whites serves as an ideal object for promoting group extension and receiving measurable results already during the lifetime of the project. In 2003, the purchase of chicks was constrained by SARS; yet the results obtained in 2003 are very encouraging. In 2004, four FTIGs in Ma Township, the majority of members being female, are raising some 900 chickens.

Irrigation: Irrigation is comprised of the two sub-components of construction and water user groups, with the objectives of rehabilitating 32 km earthen irrigation canals with stone masonry; and strengthening the capacity of the major stakeholders, PCWRB, township leaders, and villagers in managing the allocation and use of irrigation water more efficiently.

After a slow start in 2003, the contractor already started on April 1 2004 to line canals number 5 to 8. By the end of July, all but about 300 m of the 32 km canals and some minor structures had already been completed. Due to the heavy rains and flooding expected during the wet season, in July the contractor will concentrate on completing minor tasks, e.g., small bridges, tertiary outlets, and some drainage bridges. Contractually, all work should be finished by the middle of August 2004; more likely, however, it will be finished by the middle of October.

Work aimed at increasing water management and efficiency of water usage started during the second half of 2004. Together with the major stakeholders, Panam County Water Resources' Bureau (PCWRB), township, and village leaders and farmers, their current and future roles and responsibilities will be assessed and defined. As a result of this work, the mode of communication between the stakeholders and the rules and regulations will be clarified and agreed upon, thus contributing to a more efficient regime of allocating and using the scarce water resources of the Chu Sun dam.

Rural Water Supply and Sanitation: In 2001 and 2002, a survey of the water supply situation in all 114 villages of Panam County was carried out and a Master Plan developed. Based on this Master Plan, 25 villages were selected to be provided with clean drinking water through gravity pipeline systems (GPL) and 40 villages through hand pumps (HP). To address the poor sanitary conditions, a sanitation sub-component was added in 2003 and is being jointly implemented by the Rural Water Supply and Health and Education components.

To create ownership and to increase the sustainability and effectiveness of the installed water supply systems, villagers are consulted and trained, and Village Water and Sanitation Committees (VWSC) are formed prior to developing hardware such as intakes, reservoirs, and tap stands, and laying pipes. The VWSCs are the conduit for carrying out the Hygiene and Sanitation Promotion Campaign (HSPC) and follow-up measures. As of July 2004, VWSC are operational in 16 administrative villages and are in the process of being established in a further six administrative villages.

In 2003, GPL were provided to eight villages and 16 new locally-made hand pumps were installed (nine HP in three villages; three HP in three health centres; and four HP in two primary schools); and four existing handpumps were repaired (three HP in three health centres; and one HP in one primary school).

In 2004, it is planned to install GPL systems in 14 administrative villages/18 natural villages; 150 hand pumps in 32 administrative villages; and improved latrines in 17 primary schools and one clinic. By mid July 2004, the following achievements can be claimed: GPL have been installed and are functioning in eight administrative and 10 natural villages; 85 hand pumps have been installed in 16 administrative villages and three primary schools; and latrines have been installed in eight primary schools and one clinic. The remaining targets can most likely be achieved before mid October. For 2003 and 2004 combined, a total of 57 villages and 18,596 persons have benefited from the RWSS activities.

The project is also equipping the Prefecture Epidemic Prevention Station (PEPS) with the equipment and materials needed for the analysis of water samples. Furthermore, PIRDP is training the staff of the PEPS in the proper use of equipment and materials so as to generate reliable water testing results.

From clean drinking water provided in 2003 and 2004, 2,422 and 16,174 (total for 2003 and 2004: 18,596) villagers are directly benefiting in 57 villages and nine townships¹⁶. By the end of the programme, an estimated 24,000 villagers in 60 villages will be benefiting from the water and sanitation activities of PIRDP.

¹⁶ In 2003 and 2004, RWSS was operating in all Townships except Dongxi and Gapu; in 2005, RWSS will also operate in the townships of Dongxi and Gapu.

Delays in procuring materials, in particular high-pressure, high-density polyethylene pipes (HDP) pipes, and lack of counterpart staff available from the PCWRB are the main constraints the RWSS component has experienced so far.

Education: The major areas of intervention are training primary school teachers in and giving follow-up support to institutionalise child-friendly teaching methods and strengthening the planning and management capacities of the Panam County Education Bureau. By 2005, trainers who will be capable of continuing the training activities and replicating them in other counties of Shigatse Prefecture are expected to have been trained. To date two cycles of teachers' training courses have been held, covering six townships. The total number of training courses held until July 2004 are as follows: four teachers' workshops with 75 teachers; three trainers' workshops with nine teachers participating; and two key teachers' workshops with 15 teachers participating who will provide the required in-school support. In addition to the training courses, training materials relevant to the Tibetan context have been developed for the teachers' training workshops and for trainers in participatory training approaches. Furthermore, three Agriculture Field Days were held for 27 teachers, three study tours to the Tibet Basic Education Project in Metroghongkar and Lhendrup for teachers and PCEB personnel, and one study tour to the Yunnan Minority Basic Education Project in which 15 and 12 trainers, head teachers and staff from the Shigatse Prefecture and Panam County Education Bureaux, participated.

The education component is also supporting the setting up of two-year vocational training courses at the Panam Middle school, with the objectives of providing children with more options for future work in the community and of developing more advanced skills and new knowledge in farming and livestock-raising techniques. In 2003, PIRDP supported the Panam County Education Bureau (PCEB) and the Panam County Middle School (PCMS) in setting up vocational training courses by assisting in selecting and planning different vocational training courses in agriculture and horticulture, livestock raising, traditional art/painting, and in tailoring; and in renovating the building of the Vocational Centre within the compound of the PCMS at a cost of approximately € 25,000. As of July 2004, the traditional arts' course is on-going and teaching of agriculture and horticulture is soon to begin.

In conjunction with the training activities, PIRDP has, in close consultation with the PCEB, provided substantial hardware to schools as well as boarding facilities, e.g., 2,700 mattresses, desks, and chairs; solar

panels to provide light for dormitories; cleaning and washing materials, to improve the general hygiene; as well as hand pumps and improved latrines. All project schools involved in the training activities have also received boxes with basic materials in them which will allow teachers to produce simple teaching aids by themselves. Health education materials developed mainly by NGOs in Tibet, have been procured and given to schools, as will be basic books in Tibetan and Chinese as stock for small school libraries.

In 2005, the education component will extend the primary school training activities to the remaining five townships. In vocational training, the curricula for the different vocational training courses and the teaching skills of the vocational trainers will be developed and improved.

Health: The health component aims to improve the health of rural Tibetans in Panam County, particularly by reducing the mortality of mothers and infants through training of Traditional Birth Attendants (TBA) and by improving the health services in Panam County.

The training of health personnel is one of the main strategies of the project for improving the quality of health services. In 2002, more than 150 health personnel were trained, particularly through six training courses for TBAs, two training courses for midwives and hospital doctors, and one training course for township clinic (TC) doctors.

In 2003, the health personnel of Panam County were trained through the following training courses: retraining of 122 TBAs; training of 60 village doctors, 20 township clinic doctors, and 20 Panam County Hospital doctors. In addition, the leaders of the Panam County Health Bureau (PCHB) participated in a study tour to Jinan, Shandong Province, with the main objective of preparing PCHB doctors for the currently on-going six-month training courses in Jinan.

Based on previous field work and research, the hygiene and sanitation promotion campaign (HSPC) was included in the Work Plan 2003. The HSPC has the objectives of increasing awareness and knowledge about hygiene and sanitary practices—mainly related to water and sanitation—and to stimulate behavioural changes and promote active participation of the community in improving village hygiene conditions.

From August to mid October 2003, the first pilot HSPC was carried out in two townships and four villages, including an initial evaluation of the methodology. After completion of the first four pilot campaigns, the

trained local health promotion personnel continued with the health and hygiene promotion campaign in six other villages until the end of 2003; in three villages the HSPC was jointly implemented by the staff of the RWSS component.

Duly acknowledging the difficulties posed by the EU procurement regulations and procedures, in a meeting held in October 2003 the members of the Steering Committee endorsed a decision to shift the European funds allocated for construction of three township clinics to expanding the HSPC to all the villages covered by the Rural Water Supply programme. Based on the initial results, the Health Component prepared a 'Proposal for the Extension of the Hygiene and Sanitation Campaign' in 2004. Due to difficulties experienced in recruiting a new hygiene promotion expert for implementation in 2004, the HSPC is still pending.

The major constraints experienced by the health component relate to procurement of equipment and materials and to the mobilisation and recruitment of qualified health personnel. In 2003, SARS delayed the arrival of the foreign health team by two months, while, by the end of July 2004, the recruitment of both the health coordinator and the hygiene promotion expert is expected to have been completed. In 2005, the main focus of the health component will be on implementing the HSPC.

Capacity building: Through close cooperation and coordination with partner institutions, mainly at Panam County level, planning and management capacities will be improved. With the recruitment of highly qualified national staff in early 2004, the activities of all project components have become better integrated and are now clearly focused on capacity building at county level.

Major lessons learned

After an unusually long gestation period, a slow start and constraints experienced, PIRDIP has now become fully operational. All its components and activities are supporting and complementing major government policies. PIRDIP has made and is making particular contributions towards the development and reduction of poverty in Panam County, mainly through capacity building and the introduction of new concepts, ideas, and approaches to government staff and villagers, and less through the provision of hardware. Of these, the most important ones are the following.

- Participatory village planning and integrated community development

- Participatory extension methods
- Addressing the issues of poverty alleviation and long-term livelihood improvement; and from the sustainable resource management point of view, in particular from the energy point of view by—taking up the initiative of developing the ICLFM, including the planting of trees on a communal and private basis and the provision of solar stoves, thermos flasks, and pressure cookers to substitute cow dung with bio and solar energy,
- Testing, selecting and introducing new crops, varieties, and crop management techniques aimed at increasing yield, income, and the nutritional status and health of the people
- Introducing new livestock breeds to increase the production and income from livestock products; and also for improving the nutritional status and health of the people
- Institutional integration, particularly in addressing the key issues of developing the ICLFM by establishing close tripartite cooperation between TAAAS, PCBAL, and PIRDP
- Introducing child-friendly teaching methods through the training of all primary school teachers
- Assisting the PCEB in introducing vocational training courses
- Assisting the PCHB in improving mother and child health, the hygiene and sanitation, and the equipment and materials at village and township clinics and the county hospital

Major recommendations

To achieve full potential and sustainable impact of PIRDP's capacity building efforts in the Tibetan context, the time frame of less than five years is too short, and another five-year period is considered necessary. However, the Country Strategy 2002-2006 of the Commission of the European Union for China is focused on areas other than rural development, and a further extension of PIRDP has been excluded.

For the last year of PIRDP, efforts will be made to summarise the experiences since 2001, formulate models replicable for other counties, and share the experiences with other counties; as well as to assist both TAAAS and the PCBAL in strengthening their cooperation and strengthen the water management capacities at PCWRB, at the township and village level. To maintain the momentum gained, institutional integration is vital for the impact and sustainability, time, and material investment under PIRDP.

For future government poverty alleviation programmes, the following recommendations are made based on PIRDP's experiences.

- Intensification of the use of participatory approaches in identifying and prioritising needs of villagers and in planning poverty alleviation and community development activities

- Intensification of integration between different government bureaux in planning and implementing poverty alleviation and livelihood improvement programmes; this applies particularly to the emerging tripartite cooperation between TAAAS, Panam County Bureau of Agriculture and Livestock, and PIRDP
- Focus of poverty alleviation and livelihood improvement programmes increasingly on provision of alternative and renewable forms of energy. To maintain the momentum gained it is proposed to formulate a future project proposal which addresses the current lack of available energy in rural areas as its core problem, by testing, and introducing energy types on a pilot basis, and harnessing of renewable forms of energy, in particular, bio-, solar-, and wind energy.

Sustainable Rural Development in Tibet: from Poverty to Prosperity

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BACKGROUND

In May 2001, China convened the third 'Central Conference on Poverty Reduction and Development', which announced the implementation of the 'China Rural Poverty Reduction and Development Programme 2001-2010'. With this announcement, China's initiatives on poverty alleviation entered a new phase. The programme has several key features such as poverty reduction in previously neglected areas, poverty reduction in areas inhabited by ethnic minorities, new poverty reduction policies for investments and interventions, and a specific focus on mountain areas in the western region (Hongmin 2002). Therefore, it is logical that the mountain areas and people living in them have currently taken the centre stage of the development agenda in China.

In order to design strategies for development in Tibet, which is one of the poorest mountain provinces in China, the 'First Central Government Symposium on Development' was held in Tibet in 1980. It set the tone for policy reforms and restructuring and included ensuring land tenure for longer periods than hitherto (30 years) to increase production and improve the standards of living of the highlanders. The 'Second Central Government Symposium on the Development Process in Tibet' was held in 1984, and, as a consequence, more reforms were proposed and implemented. A 'Third Central Government Symposium' was held in 1994. This symposium was important in that it proposed a new model for the development strategy in Tibet, whereby developed provinces of China were to adopt prefectures for development support, investment, and expert human resource services; in addition to central government investments. This development philosophy continues to date, and it may be time to assess the performance of this approach. In addition, new challenges and opportunities have emerged for Tibet during the past few years.

This paper tries to set the tone for discussion. It starts by explaining poverty dimensions and why mountains are home to the poor. The