

Making Space for Development

A Study on Resettlement from the Longyangxia Water Reservoir Area of Qinghai Province

Jarmila Ptackova

Oriental Institute of the Czech Academy of Sciences, Prague, Czech Republic
ptackova@orient.cas.cz

Abstract

Large transformations in the landscape and subsequent shifts of population have become an integral part of state development projects in western China. In the context of expanding infrastructures such as river damming, large-scale resettlement might appear to represent an effective solution in response to immediate or short-term needs. However, viewed from a long-term perspective it has the potential to unleash a range of major social, economic and environmental effects which may have an impact on not only the affected people and surrounding landscapes. This paper discusses major challenges of relocation evoked through the damming of the Yellow River in Qinghai Province.

Keywords

river damming – Longyangxia reservoir – resettlement – infrastructure expansion – spatial and social changes

The disappropriation of land and relocation of people in cities and rural areas of the People's Republic of China has been an integral part of state-launched modernisation projects. The declared aim of many projects has been to help

* I would like to offer my thanks to all my informants who, unfortunately, cannot be named in person. Without their assistance the paper could not have been written. This paper was improved significantly by comments and assistance on the part of the editors and reviewers. I thank the Chiang Ching-kuo International Sinological Center at Charles University in Prague, which kindly supported the development of this paper.

solve socio-economic problems; in other cases, resettlement has been implemented in order to realise large-scale environmental and infrastructural projects. With the ongoing Open Up the West Programme (Ch. *xibu da kaifa*) the number of infrastructure-related resettlements is high. Qinghai province is one of the centres of mass relocation. The state interest to protect the fragile environment on the Qinghai-Tibet Plateau, as well as the poverty alleviation programmes targeting the population in rural areas, both declared relocation necessary to achieve their aims. Since the southern part of Qinghai province was declared the National Nature Reserve of the Three Rivers' Headwaters (Ch. *Sanjiangyuan Guojiaji Ziran Baohuqu*) in 2003 (Foggin 2005), it became eligible for additional means from the development fund. This enables implementation of extensive relocation programmes. In the last 10 years, almost 56,000 people were relocated there with the declared aim of releasing pressure on the grassland and in order to improve their living standards (Zha 2014). Although the number of people resettled due to river damming is comparably high, river damming has been largely neglected in the studies on current mass relocations.

Resettlement due to river damming started earlier than large-scale environmental programmes and rural poverty alleviation projects. China is the country with the highest number of river dams in the world and it has constructed over 20,000 large dams, more than 15 m high, since the 1950s (Lewis 2013). One of the most disputed is the Three Gorges Dam on the Yangtze River (Dai 1994; Salazar 2000; Topping 1995). The mass relocation caused by the construction of this dam remains one of the most controversial issues of this project. Aiming to complement and expand the current debate on mass relocations in Qinghai and beyond, this paper sets out to explore river damming as a trigger of long-term effects for the surrounding regions and on the affected population. Drawing on three resettlement examples from Longyangxia water reservoir area in Qinghai, this article shows that the major environmental and socioeconomic challenges connected to relocation caused by expanding infrastructures, for example river damming, remain unsolved and their impact uncertain. The majority of data used here were collected during numerous field trips to Tibetan areas of Qinghai Province between 2007 and 2013.

The Longyangxia Dam

Although difficult to access, the Qinghai-Tibet Plateau has great potential for the generation of hydroelectric power. The major Asian rivers have their sources there and the plateau edge in particular offers favourable locations for



FIGURE 1 *Dams on the Yellow River.*

SOURCE: [HTTP://WWW.MELTDOWNINTIBET.COM/F_RIVER_YELLOW.HTM](http://www.meltdownintibet.com/f_river_yellow.htm)

hydroelectric power stations. In Qinghai province, between the late 1970s and 2012, 47,640 people were forced to leave their original homes to make way for river dams and hydroelectric power stations, such as the Longyangxia, Lijiaxia, Gongboxia, Nina, Laxiwa, Kangyang, Zhiganglaka and Suzhi. Additional hydroelectric power stations—Bingling, Jishixia, Dahejia, Huangfeng, Banduo, Yangdian, Maerdang, Shitouxia and Nazixia (Figure 1)—are under construction and will require the relocation of a further 51,855 people by 2020. An investment of 622 million RMB should secure the successful realisation of the resettlement programme (QHS34 2013). But the funding refers only to the immediate impact on the local population of dam construction and the emerging reservoirs. It does not address the secondary impact manifested in the increased need for assistance during the adaptation period after relocation, the securing of sustainable alternative livelihoods for the relocated people, or extension of the relocation programmes, which may be induced by unexpected factors which I describe below.

The Longyangxia dam was constructed on the Yellow River in the Longyangxia canyon, 1,648 km from the river's source. The average altitude of the dammed water area is 2,700 m above sea level (Chincold 2010). It lies in the administrative unit of Hainan Prefecture, at the border of the Gonghe/chab cha¹ and Guinan/mang ra Counties. The total surface area of the reservoir is 383 m². The dam was built for the purposes of hydroelectric power

1 The first name is Chinese, the second Tibetan. Some toponyms are used commonly in Chinese though, e.g. Longyangxia. In the present article I use Chinese place-names because in the context of development Chinese terminology predominates. Also, the new village settlements were created only under the Chinese administration.

generation, irrigation, ice control and flood control. Longyangxia is the first of the stair-step power stations along the Longyangxia-Qingtongxia river section (Lan *et al.* 2001). The construction of the Longyangxia dam started in 1976. With a height of 178 m, on completion it became the highest dam in China.

The actual damming of the river began in 1979. Hence, also in the late 1970s the first relocations of affected residents began (Xinhuanet 2009). Contrary to state-employed engineers' assumptions about the impact of the damming on the river's behaviour, the water level has since continued to rise steadily and has had a huge impact on the local environment and the pastoralist and agriculturalist inhabitants of the surrounding areas (Lan *et al.* 2001). In the Gonghe basin, the size of the southern half of the Longyangxia reservoir surface increased from 795 ha in 1976 to 10,838 ha by 2006 (Feng *et al.* 2011). Due to the still increasing water level, new villages and fields continue to be flooded. Moreover, because of strong water-level fluctuations, land and fields that normally stand above the actual water level are also occasionally being shoaled and are not suitable for agriculture any more. Thus, 30 years after the completion of the dam and the launching of the hydroelectric power station in 1986, the water level of the Longyangxia is still rising and continues to impact the surrounding environment, necessitating the relocation of more and more people.

During the first relocation phase between 1977 and 1991, in Gonghe County 34 villages in five townships—a total of 3852 households—were relocated to make way for the Longyangxia reservoir (KQYMZXR 2013). On the southern side of the dam, in Guinan County, additional villages had to be moved. Due to the continuous increase of the water level, some households and village communities from the Longyang basin have been forced to relocate up to three times since the start of the dam construction (Xinhuanet 2009). In the following section I describe three resettlement projects in Guinan County.

Three Relocation Projects in the Longyangxia-affected Area

New Settlement in Guomaying/mgo mang

The resettlement site in the vicinity of Guomaying town is already the second one for the Tibetan community since the abandonment of the Longyang basin. The approximately 100 households relocated to this site were semi-pastoralists,² depending mainly on animal husbandry but also partly engaged in farming. At the first site, the resettled people were provided with land for

2 In this region they are referred to in Tibetan as *rong ma 'brog*.



FIGURE 2 *New settlement near Guomaying. Livestock farm in the background does not belong to the settlement.*

PHOTO J. PTACKOVA, JULY 2013

cultivation but with no grassland. After only about two years, however, the village was again forced to move to a new location near Guomaying town.³ In the new settlement (Figure 2), the houses were paid for and constructed by the government.

Although use rights⁴ over some agricultural land were granted to the villagers, again no grazing space suitable for keeping livestock was made available and in the tight courtyards it is difficult to build even small animal sheds. Because households have no livestock anyb more, some of the villagers leave to seek jobs in Guomaying and other towns. Some also return to the original village periodically, as several fields there can still be tilled during the years when the water level of the Longyangxia is low. As villagers no longer have

3 Fieldwork interview with a relocated Tibetan pastoralist, new village near Guomaying, July 2013.

4 The land is owned by the state. The individual households have user rights over certain plots of land.

herds, part of the food must be now purchased with cash; this, however, is in short supply.

The New Village of Lagan/rab rgan

Lagan village in Guinan County was constructed 10 years ago as a relocation site for one of 11 local Tibetan communities which were resettled when the Longyangxia canyon was flooded. The land on which the village was built used to belong to pastoralists from Guinan but ownership was transferred to the state during the Democratic Reform. The new village is situated close to the Guinan County seat, about 30 km away from the original site. The courtyards belonging to houses in the village are larger than those in the settlement near Guomaying and a few cows or some agricultural machine tools find their place here. There is also a school in the village. Though these resettled Tibetans were also semi-pastoralists, the Lagan village has no pasturelands attached. On the available fields, the variety of possible crops is limited due to the colder climate. While in the former location the villagers planted tomatoes and melons, rapeseed is now the main crop. The relocated Tibetans families were granted some funds to build new houses by themselves. Thus, this village exhibits a less uniform structure when compared with the settlement near Guomaying town. In 2012, during the state-initiated campaign to 'beautify the countryside' (*meili xiangcun*), additional funds were granted to help build new high walls, with colourfully painted tops, around each courtyard. The beautification project predominantly targets villages and settlements along main roads, and its declared aim is to create a pleasant atmosphere for both village inhabitants and potential visitors.

The New Village of Demang/sde mang

The original Demang village is situated in the Shagou/bya mdo Township of Guinan County, about 20 km from the Longyangxia Dam. The villagers were informed about the damming project only when the construction works were already in progress, and were assured that the water level would not reach their village and agricultural land.⁵ However, though Demang village was not among those originally to be flooded, it was affected at a later stage due to the unforeseen ongoing increase in the water table many years after the dam construction was completed. When the fields became flooded, the villagers demanded help from the local government, which decided to solve the problem through relocation.

5 Fieldwork interview with a Tibetan villager, July 2013.



FIGURE 3 *Sandy fields of the old Demang village.*

PHOTO J. PTACKOVA, JULY 2013

The original Demang village is still intact, as the area was not flooded completely and only part of the fields were thus far affected, especially those situated on the lower side of the village along the Shagou River—a tributary of the Yellow River. The river's rising water table turned the fields into a collection of sandy banks (see Figure 3), which are no longer suitable for agriculture.

Because the rising water level so far damaged only part of the village's fields, only about one-third of the population was designated for relocation. A plot of land in the neighbouring Guide County, near the county seat, was selected as a suitable site for the new settlement and the Guinan county government purchased the plot from the Guide county government. Decisions on who exactly would relocate were made by the villagers themselves. Groups of three households were created and from each group one household was expected to sign up for resettlement. If in one group no household wished to move, the group was free to negotiate with other groups in order to fulfil the relocation quota.

Though it did not destroy all the fields, the landscape changes inflicted by the construction of the dam caused severe logistical problems for the Tibetan community in the old Demang village. The village was situated 35 km from the



FIGURE 4 *New Demang village.*
 PHOTO J. PTACKOVA, JULY 2013

Gonghe county town, which was also its nearest market place. Though the villagers had to cross the Yellow River on the way, the water level in this section was comparatively low and the river itself was relatively narrow. This changed with the construction of the Longyangxia dam and other dams and reservoirs further downstream. Since the Longyangxia canyon was flooded, the Demang villagers have to travel between 130 to 250 km around the reservoir in order to reach Gonghe. The old village is now closer to Guide/khri ka and Guinan towns in terms of travel, but even these still lie between 100 and 130 km away. The construction of the dam thus restricted access to health institutions, schools, markets and paid labour, increasing the degree of socio-economic difficulty.

Compared with the original village, the new Demang village, constructed in 2010–2011 (Figure 4), has a more favourable location close to the provincial road to Xining, the provincial capital. Furthermore, although like the earlier settlement near Guomaying it was constructed by the government, the differences are striking. Whereas the settlement near Guomaying is dusty and grey, the quality of the buildings poor and public facilities lacking, in the new Demang village attention was paid to creating a neat appearance for the

whole site and to the development of public amenities. For example, there is a public square, a large playground and a kindergarten. Each household is provided with running water and electricity. Moreover, stalls in the courtyards to accommodate sheep were co-financed by the local government. Because there is no pastureland, the stalls are used to raise pigs or as greenhouses for vegetable and flower cultivation. Crops are also yielded from the fields attached to the village.

In a significant difference to relocation sites constructed earlier, a Buddhist temple—partially funded by the local government—was erected in the village. The temple construction started immediately after the resettlement and was almost completed in 2013. On a small hill above the village, the villagers also erected a new *la btsas*, a place to worship local deities and village protectors. Settlements constructed earlier rarely comprised public use areas and places of public worship. Accordingly, it was common for each household to build a small incense burner in the courtyard. As in the majority of cases of relocation it also became more difficult for the villagers to reach monasteries and request monks to perform rituals, the lack of a public worship place has usually been among the main points of complaint in relocation sites. The two older settlements mentioned above both lacked any kind of public worship place in their original design. Only in 2012 and 2013 were the community members able to construct these, albeit at their own expense. In the settlement near Guomaying the villagers erected a new stupa. In Lagan village a temple was built and the *la btsas* was moved to the new village from its original location (Figure 5).

At the same time, although some elements of the resettlement process differ, in the new Demang village also the prospective villagers were not consulted during the planning and design phase. As a result, the new concrete houses are considered uncomfortable by the majority of resettled villagers and those with sufficient financial means construct a second, wooden building in the style of a Qinghai farming house next to it. It is now these new wooden houses that serve as the main living quarters for the resettled families.

Damming and Its Socio-spatial Implications

The completion of a river dam inaugurates a chain of implications which can be divided into two categories. First, the immediate and obvious impact on the landscape and the people related to the flooding of the land and depopulation of the reservoir basin. The transformation into a water landscape destroys the ecosystems around the reservoir as animal and plant habitats vanish. Damming may also even enhance soil erosion and trigger earthquakes around



FIGURE 5 *Old wooden arrows brought from the old la btsas to the new village of Lagan.*
 PHOTO J. PTACKOVA, JULY 2013

the dams and reservoirs (International Rivers 2010), further negatively influencing the lives of the inhabitants of the affected areas.

The secondary impact is felt in an indirect way over a long period and continues to have an influence on larger and more distant plots of land. When resettling the population away from the nascent reservoir, new sites have to be developed to host the new settlements, and it is often the case that hillsides or grassland are adopted for cultivation (Li *et al.* 2001), such as in the case of Lagan village. The concentration of the population in new centralised settlements and the extensive use of local land, however, further exacerbate the degradation of the environment and thus lead to even more environmental resettlement projects (Yan & Fei 2009).

Moreover, the resettled population is exposed to rapid changes in livelihood (cf. Cernea 1997) and 'involuntary relocation usually results in people being transferred from a social environment in which they were primary actors to one in which they are aliens' (Yan & Fei 2009: 12), a situation which can further lead to conflicts with the previous users of the land. As the communities are relocated, their social ties with neighbouring communities and local

authorities become severed, which further increases the marginalisation of the relocated people. The household registration system (Ch. *hukou*), which regulates where the citizens obtain social benefits and services, is another hindrance on the way to successful integration in the new location. In the cases illustrated above, the resettlement did not lead to the shift of household registration to the new location. Instead, the registration remained at the original village site, even though some of the communities were resettled to different counties. This leads to additional complications and hampers integration in the new administrative unit. Adapting to new locations is, of course, most difficult for elderly people, who find it hard to establish new social networks and join in the cash-generating labour.

State Approach to Damming-caused Resettlement

Resettlement, including the integration of the resettled people into the new social, cultural and work environment, is necessarily a long-term project. The process can be divided into three phases: the planning stage, the implementation and adaptation period, and the incorporation period (Scudder & Colson 1982). In China's numerous resettlement projects, the emphasis is typically placed on the first two phases: planning and implementation. After that, government officials tend to declare the projects successful, typically supporting their claims with selected statistics. For the relocated people, however, major challenges begin with the implementation, when alternative livelihoods must be created. In new settlements, because no livestock is held, daily expenses usually rise. Thus, even when fields can provide food for the family, the majority of the younger generation have to seek out additional sources of income. In new settlements, potential for employment or business activity is limited, owing to the shortage of customers. Low education levels, limited Chinese language and management skills, low investment capacity and the inability to deal with the challenge of leaving the village additionally hinder the shift to a new profession and integration in urban economies. By placing the new settlements closer to towns and communication routes, the government obviously hopes to facilitate finding employment. However, the competition among unqualified workers is continuously on the rise owing to immigration of predominantly Han and Hui workers from other provinces. Therefore, even in settlements established more than 10 years ago, such as the one near Gumaying, a substantial portion of the population has been unable to find a sustainable substitute for their previous occupation and lives in a prolonged state of precariousness.

So far, the government's actions to ameliorate long-term adaptation and generate new sustainable livelihoods have been limited. The most common

model is various kinds of compensations and/or subsidies for the resettled households. The compensation model has significantly changed since the beginning of the dam-construction boom in the 1950s. Li, Waley and Ress (2001) demonstrate, for instance, that in the early period no alternative housing was offered to the dislocated households, only cash. Later, the relocation programmes tended to provide new housing and, sometimes, also a financial subsidy, which however was too low to provide any measure of security. During the first stage of the resettlement from the Longyangxia basin, the relocated households either obtained a house (Guomaying settlement) or money to build one (Lagan village). A regular financial subsidy to the relocated households, however, was not a common practice. Among the three settlements described above, only the inhabitants of the new Demang village claimed to have obtained 600 RMB per person per year between 2011 and 2013—the year when I conducted my last field trip to this area. Though low in absolute numbers, these payments seem to signal a growing understanding on the part of the government of the difficulties experienced by the resettled people in new locations. Also, the Guinan County government has, since 2006, invested 113 million RMB in various attempts to address the urgent issue of insufficient income alternatives, improve basic public infrastructure, medical care and education at older resettlement sites. The government claims that, due to these measures, the average annual income in the settlements had already risen from 1,100 RMB in 2006 to 4,965 RMB by 2011 (DDHM 2012). However, as the price of food and other essential goods had also risen significantly in that period, even with higher earnings the living standard had not necessarily improved. Moreover, government financial subsidies granted to the villagers are also included in the statistical income, thus distorting the picture of an individual's actual ability to generate income.

In addition to improving public infrastructure or direct cash payments, the unstable economic situation in the new settlements necessitated further involvement of the local government. For example, new vocational trainings for the resettled people were initiated (DDHM 2012; KQYMZXR 2013) and the maintenance of the houses became the government's responsibility. In Gonghe County, on the northern side of the Longyangxia, the local government renovated 1,200 houses in 2011, about one-third of those constructed between 1977 and 1991. Another 54 million RMB project was launched in Gonghe County in 2012 with the declared aim of improving quality of life (e.g. by providing drinking water supplies) and enhancing income prospects of about 10,000 people at 14 resettlement sites in Longyangxia and Tiegai/the ge townships (LYXY 2012). All these recently launched initiatives make clear that the actual duration of resettlement projects vastly exceeds the phases of planning and

implementation, and the state's assistance must accordingly be reformulated in much longer timeframes.

Conclusion

Since the 1950s, at least 50 million people have been resettled in China to make way for the expanding transportation infrastructure and the establishment of economic development zones (Xiao 2011). China began constructing river dams on a large scale in the 1950s, but the country's pressing need for energy (Sternfeld 2006), as well as its aim to explore non-fossil energy sources, has led to a new increase of river dam construction (Cho 2011): 100 large dams and more than 40 smaller ones are under construction or in the planning phase along the Yangzi, Upper Mekong, Nu, Hongshui and Jiulong rivers in the southwest. In Qinghai alone, in connection with hydroelectric power projects approximately 100,000 people have been or are to be relocated (QHS34 2013). These already very high figures relate only to the directly affected populations in the initial phase of the projects. However, as demonstrated above, such highly invasive infrastructure projects as dams and water reservoirs bring about prolonged and hard-to-foresee impacts (He *et al.* 2010; Richards 2004) which further contribute to the deterioration of the fragile ecosystems in High Plateau areas like Qinghai.

In the current state-initiated infrastructure development, relocation is used as a solution for the immediate question of space demand. Its hasty implementation, however, leads to new social and environmental challenges. The ongoing resettlement cases show that no major changes have been made in relocation procedures over recent decades, although the model has shown severe failures. The majority of the recently relocated households have to face the same economic and social problems as their predecessors (Li *et al.* 2001); the current situation at the Longyangxia reservoir area leaves little place for optimism. Although new settlements appear to be constructed with access to higher budgets, the major issue of how to integrate the resettled population socially as well as economically into the new environment is still the subject of neglect, being dealt with only *post facto* during the secondary evaluations of the projects. The additional investment provided for settlements at a later stage predominantly addresses acute challenges that emerged after the relocation, but do not solve the crucial issues of adaptation and sustainable existence.

References

- Cerne, M. 1997. Hydropower dams and social impacts: a sociological perspective. *World Bank Paper* 044. Washington (DC): World Bank.
- Chincold (Chinese National Committee on Large Dams). 2010. *Longyangxia Hydropower Project*. <http://www.chincold.org.cn/dams/rootfiles/2010/07/20/1279253974093926-1279253974095162.pdf> (accessed 03 June 2013).
- Cho, R. 2011. *The Push to Dam China's Rivers*. <http://blogs.ei.columbia.edu/2011/05/19/the-push-to-dam-china%E2%80%99s-rivers/> (accessed 24 February 2016).
- Dai, Q. 1994. *Yangtze! Yangtze!* London: Earthscan.
- DDHM. 2012. *Dang de huimin zhengce huiji Guinan xian Longyangxia kuqu yimin* [Benefits provided by the Party's policy to the people of Guinan county relocated due to Longyangxia reservoir construction]. qh.people.com.cn/n/2012/1205/c182768-17818205.html (accessed 3 June 2013).
- Feng, Y., Q. Lu, B. Wu, H. Liu, X. Wang & T. Che. 2011. Land-use dynamics of an alpine-cold desertified area in the Qinghai-Tibetan Plateau in the last 30 years: a case study in Guinan County, Qinghai Province, China. *International Journal of Sustainable Development & World Ecology* 18(4): 357–65.
- Foggin, M. 2005. Promoting biodiversity conservation and community development in the Sanjiangyuan Region. *Plateau Perspectives*. www.plateauperspectives.org
- He Huijun, Yu Zhigang, Yao Qingzheng, Chen Hongtao & Mi Tiezhu. 2010. The hydrological regime and particulate size control phosphorus form in the suspended solid fraction in the dammed Huanghe (Yellow River). *Hydrobiologie* 638: 203–11.
- International Rivers. 2010. The Qinghai earthquake and dams. <http://www.internationalrivers.org/resources/the-qinghai-earthquake-and-dams-3770> (accessed 24 February 2016).
- KQYMZXR. 2013. *Kuqu Yimin Zhan Xiaorong—Gonghe Xian Longyangxia Kuqu Yimin Houqu Fuchi Gongzuo Ceji* [Resettled immigrants in the reservoir area showing smiles: Notes concerning later stage support in resettlements in the Longyangxia reservoir area of the Gonghe county]. qhnews.com/newscenter/system/2013/09/277011198586 (accessed 8 October 2013).
- Lan, Y., E. Kang, Q. Ma & J. Zhang. 2001. Study on trend prediction and variation on the flow into the Longyangxia reservoir. *Chinese Geographical Science* 11(1): 35–41.
- Lewis, C. 2013. China's great dam boom: a major assault on its rivers. *Yale Environment* 360. http://e360.yale.edu/feature/chinas_great_dam_boom_an_assault_on_its_river_systems/2706/ (accessed 23 February 2016).
- Li, H., P. Waley & P. Rees. 2001. Reservoir resettlement in China: past experience and Three Gorges Dam. *The Geographical Journal* 167(3): 195–212.
- LYXY. 2012. (Ed. Gonghe Xian Zhengfu). *Longyangxia Yiji Ti Shuibengzhan Gaizao Gongcheng Zhengshi Kagong Jianshe* [Construction start of the Longyangxia first

- level water pump remake project]. xxgk.qh.gov.cn/html/1659/200175.html (accessed 24 February 2016).
- QHS34. 2013. *Qinghai Sheng 34 Nian Anzhi Shuidian Yimin 5.7-wan Ren*. [34 years of implementation of resettlement and water and electricity supply for 57,000 people in Qinghai]. news.xinhuanet.com/yzyd/local/20130717/c_116567692.htm (accessed 10 November 2013).
- Richards, C. 2004. One step forward, two steps back: China's new environmental assessment procedure waters down opposition to damming. *New Internationalist* 364: 8.
- Salazar, J. 2000. Damming the child of the ocean: the Three Gorges Project. *Journal of Environment & Development* 9(2): 160–74.
- Scudder, T. & E. Colson. 1982. From welfare to development: a conceptual Framework for the analysis of dislocated people. In A. Hansen & A. Oliver-Smith (eds.), *Involuntary Migration and Resettlement: The problems and responses of dislocated people*: 267–87. Boulder (CO): Westview Press.
- Sternfeld, E. 2006. *Umweltsituation und Umweltpolitik in China*. <http://www.bpb.de/apuz/29361/Umweltsituation-undumweltpolitik-in-china> (accessed 24 February 2016).
- Topping, A. 1995. Ecological roulette: damming the Yangtze. *Foreign Affairs* 74(5): 132–46.
- Xiao, J. 2011. The migration-displacement nexus in China, in K. Koser & S. Martin (eds.), *The Migration-Displacement Nexus. Patterns, processes, and policies*: 145–55. New York (NY): Berghahn.
- Xinhuanet. 2009. Tibetan migrants from reservoir area start new life. *China Tibet Online*. www.china.tibet.people.com.cn/6822377.html (accessed 5 June 2013).
- Yan Tan & Fei Guo. 2009. Environmentally induced migration in West China (on-line proceedings of the xxvi International Population Conference). <http://iussp2009.princeton.edu/abstractViewer.aspx?submissionId=92044> (accessed 24 February 2016).
- Zha Luo. 2014. Sanjiangyuan Diqu Shengtai Yimin de Jingji Shehui Fengxian Fenxi [Socioeconomic risk analysis of ecological resettlement in the Sanjiangyuan area]. *Qingzang Gaoyuan Luntan* 2(7): 1–10.