

Case Study No. 1, written by Lei Shen, 2007

## The Duyun ASM Owner Association: A Model for China's Small-Scale Miners

### Overview

This case study focuses on the city of Duyun, located in Guizhou province, where a mining cooperative called the DAOA is working together with the local government in an effort to adopt better management practices in their mining activities. The DAOA's overall goal is to ensure mine profitability, and at the same time improve the lives of mine workers and the local community, and ensure the environment's protection.

#### Background: Zinc Production, Consumption and Small-scale Zinc Mines in China

China is one of the world's largest zinc producers and consumers, and with rapid economic growth, its domestic consumption of zinc has risen rapidly over recent years. Domestic zinc consumption in China has soared from 500,000 tons in 1990 to 2.5 million tons in 2004, a fivefold increase. In 2005 a milestone was reached, with over 3 million tons of zinc consumed in that year alone.



The president of the DAOA (on the left) discusses mining activities with a colleague.

To date, more than eight hundred lead-zinc mines have been set up across the country. Of these, about five hundred mines are being mined by small-scale enterprises. Even though by 2005, China needed almost 3 million tons of zinc for domestic use, local zinc production only reached 1.8 million tons, the rest being imported from foreign sources.

In total, there are 411 small-scale lead-zinc mines spread across China's twenty-seven provinces (autonomous regions and municipalities). Typically, small-scale mines are mismanaged, and mine operators often disregard the social and environmental consequences of their mining practices.

### Summary of Issues

- Guizhou is one of China's least developed regions,
- inhabited by a large, impoverished ethnic minority population.
- with no integrated management plan in place since mining activity began in the region
- and adverse effects on local community and environment by mine mismanagement and negligent mining practices,
- DAOA, in partnership with local government introduces better socially and environmentally sensitive management strategies trying to redress this imbalance.

### Who Are the DAOA?

This case study focuses on one particularly mismanaged mining area in Niujiatong in the Duyun region of Guizhou province, in the poorest part of southwest China. Even though most of the mining operations in this area are poorly managed, and socially and environmentally negligent, this case study identifies a number of mines that buck this trend.

The Duyun ASM Owner Association (DAOA) is a cooperative of thirteen small zinc mining enterprises that have linked together in an effort to ensure effective mine management, and to safeguard the mine workers and the local community's legal rights.

## What Are the DAOA's Guiding Principles?

From the DAOA's earliest days, members agreed to hold monthly meetings to discuss how the co-op was progressing, voice any grievances, and talk about the best management strategies to be employed to ensure that all the association's goals were met. The DAOA has developed a comprehensive list of mini-targets they feel are important to ensure their cooperative is a success, including to:

- a. Implement and carry out all laws, policies and work arrangements issued by the Land and Resources Bureau in an effective and sincere manner;
- b. Consider all aspects of the mine operation in regards to the owner's plans and coordinate activities with government authorities so they can give their support and help with problem-solving ;
- c. Help mine owners develop a standardised system that measures performance efficiency;
- d. Act as an intermediary during situations of cross-border exploitation or when workers' or the local community's rights are threatened, helping to resolve any potential conflict;
- e. Regularly organise information exchanges on effective production and management strategies, and on environmentally sustainable resource development and management;
- f. Estimate the lowest selling price that reflects up-to-date market conditions, and promote a secure market environment;
- g. Ensure owners' rights and interests are protected, and that co-op members work together to encourage profitable, but sustainable, resource development;
- h. Supervise and inspect mine operations, ore grade quality, tailings management and disposal, and other technical requirements, and solve any problems in a timely manner;
- i. Supervise and inspect mine operations to ensure environmentally sensitive practices are implemented including post-operation mine rehabilitation, optimum mining performance, and that owner's are always held accountable for their actions;
- j. Establish effective security systems, ensure mine safety, and monitor for and prevent any potential security threats;
- k. Ensure mine workers rights are protected, and that miners and their families are fully insured in case of both fatal and non-fatal accidents. Also, ensure that any accidents are fully investigated in a timely fashion, and in strict accordance with state laws and regulations;
- l. Deal with miners' grievances and resolve the problem in an appropriate manner, and;
- m. Ensure that a part of the profits from mine operations are reinvested back into the villages and local communities affected by the mines, supporting development programs focusing on areas like education, infrastructure construction, and maintaining a good relationship with local farmers and surrounding communities.



Members of the Miao tribe in traditional costume, Guizhou Province

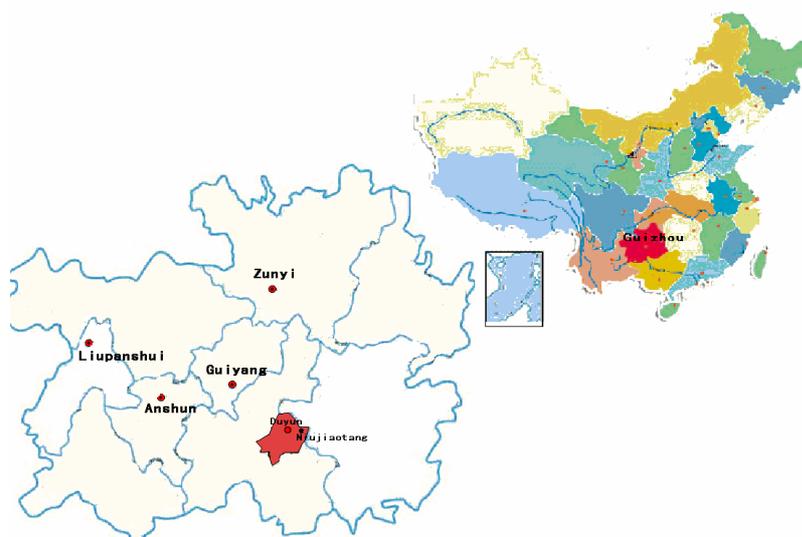
*The DAOA has developed a comprehensive list of mini-targets they feel are important to ensure their cooperative is a success.*

### Duyun: A Typical Artisanal and Small-Scale Zinc Mining (ASM) Area in China

Guizhou, one the least developed provinces in China, is located in the southwest of China, and is inhabited by several ethnic minority groups. Duyun is the capital of Qiannan Buyi and the Miao Minorities Autonomous prefecture in Guizhou province (Figure 1). This case study focuses on the Niujiaotang zinc mining area, the largest zinc mining area in Dunnyun. The mine covers an area of 4.8 square kilometres, and has good transport infrastructure allowing easy access to the existing dispersible ore bodies. The area's proven zinc reserves are about 520,000 tons, with an average grade of 7% and highest grades of up to 20%.

In the years before 1999, this mining area had no integrated development plan. It was common for local government departments to get involved with illegal mining operations, and mine mismanagement was widespread. In 1999, however, the local government set up the Duyun Land and Resources Bureau and the Niujiaotang Zinc Administration Centre in an effort to regulate mining activity by shutting down unlicensed and illegal mining enterprises. These government bodies also helped to get the DAOA off the ground, a group of eleven mining enterprises that have united together to form a Small Mines Association. Establishing the DAOA meant that the member mine operators could now introduce management strategies that ensured more effective and profitable mining practices and protection of workers' rights and the environment.

All of the mine operators participating in the DAOA are privately owned enterprises, occupying from one to three mines, and annually extracting an average of 5,000-10,000 tons of zinc by flotation method. Increased productivity resulting from the introduction of new more effective management strategies by the DAOA, has compelled two more mining enterprises in the area to join the cooperative, and now the association consists of thirteen member mines.



Map showing location of Duyun (highlighted in red), Guizhou province, China

## Some Best Practices Outcomes Resulting from the Establishment of the Duyun ASM Owner Association

The DAOA is an excellent model for other potential cooperatives across China, and many lessons can be learnt from their experience. Some of the best practice outcomes resulting from DAOA actions are that:

### a. Mining performance safety is guaranteed.

With local government providing administrative and technical support, the DAOA can successfully assess the structural characteristics of the geology in the mining area and identify suitable sites for mineral extraction. Also, with good management strategies, the DAOA can help miners ensure that mine plans don't overlap, enabling mine operators to differentiate between the various mine leases. In this way, owners can secure their ore property rights, and avoid potential land disputes.

By holding monthly meetings it's easy for miner operators to communicate freely, so if there are any changes in one mine other mine owners will be notified quickly, and can make the necessary adjustments to their management plans and mining activities to ensure that productivity isn't negatively impacted. Since operator's mining rights are now guaranteed, they're more motivated to re-invest back into areas like mine safety, production efficiency and upgrading equipment. They know their mines are secure, so they're willing to take more financial risks to ensure the mines are managed more effectively. For this reason, the mines within the DAOA can boast an almost perfect safety record for the last seven years, without a single major mine-related accident occurring.

### b. The environmental situation has improved in and around the mine site

One of the most important policies set out by the DAOA is that ASM owners undertake total environmental restoration after mine closure, and the association is responsible for the supervision and inspection of these activities. On an encouraging note, over the past seven years the association's member mines have re-invested more than RMB 1 million (about AUD150,000) of mining profits to improve the mine environment. All told, they've planted 120,000 trees, sowed 834 kilograms of grass plants, and transplanted more than 40,000 square metres of sod. The resulting green area measures an impressive 169.8 Chinese acres (about 11.2 ha), and the environmental conditions of the mining areas have improved significantly.

### c. The efficiency of resource utilisation has also improved significantly.

Investment in mine safety and upgrading equipment, and implementing more streamlined and efficient management systems has seen a significant increase in overall mine productivity. Working along side government departments, the DAOA coordinates regular inspections of operations, assessing the environmental impact of abandoned mine slag and tailings, and collecting mine waste samples for scientific analysis. In 2005 alone, a total of 216 samples were collected. Of these samples, the average grade of incoming raw ore amounted to 3.48% with 0.28% of average tailing grade and 0.55% of abandoned wastes, resulting in a beneficiation recovery rate of 91.25%, which is far higher than existed before the DAOA was established.

## The Duyun ASM Owner Association (DAOA) - How is it Organised?

The formation of the DAOA was underpinned by a set of strong guiding principles based on a philosophy encompassing equality, a strong work ethic, teamwork, and ensuring the members' rights were protected.

The association's president, who works on a voluntary basis, was elected democratically by the co-op's members. The DAOA's member mine operators knew it was important to choose a president who possessed a number of qualities including: an understanding of local, state and national mining laws and policies; strong management and leadership skills; a willingness to serve the public; and a self-awareness that he was elected president to serve all the members equally, and not for self gain. This last point is quite significant, as the person who was elected as the DAOA president already wielded considerable power, being the richest operator in the co-op with control of three large mines.

## A Unique Partnership: The DAOA and Local Government Work Together

With the support of local government departments that oversee natural resource development and management the DAOA has been able to make great strides in its mining activities. Through the DAOA, mine owners have been able to develop a dialogue with local government to gain advice on the most effective mining management approaches and appropriate problem-solving strategies. In this way the DAOA has truly become a link between local government and mining enterprises enabling a strengthening of this relationship and this has led to operators employing more streamlined operations at a much lower running cost.

This relationship has placed the DAOA in a unique position where they can communicate efficiently with the relevant government department so any problems or potential conflict can be quickly addressed.

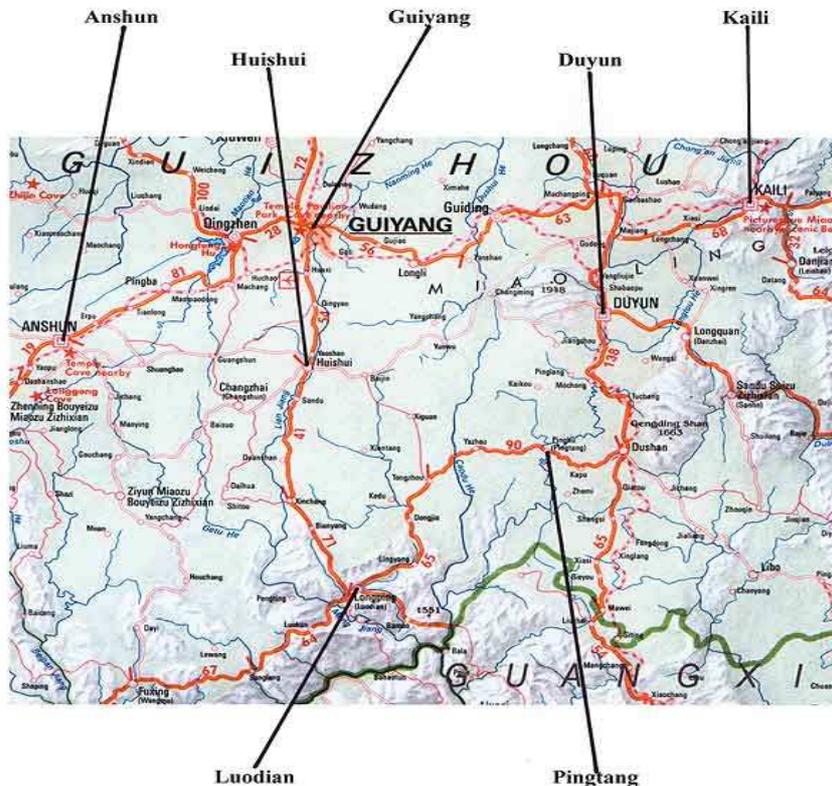
Consequently the DAOA plays an extremely important role by making sure that their mine workers legal rights are safeguarded and that the local farmers' and community's interests are taken seriously. Also the co-op now has a lot of experience with mine management and dealing with social and environmental issues so instead of always relying on government intervention when difficulties arise the DAOA can tackle problems



The concentrating facilities at one of the DAOA member's mines



Environmental damage at a mine site in Guizhou province



Detailed map of Guizhou province showing Duyun

*“... the DAOA has truly become a link between local government and mining enterprises enabling a strengthening of this relationship... and this has led to operators employing more streamlined operations at a much lower running cost.”*

## Conclusion: The DAOA Experience - Is it a Success?

Since introducing new more effective management strategies there's been significant increases in productivity levels and mine profitability. This means owners have more money to invest back into the local community, in the form of various development programs. Seeing as one of the DAOA's core principles is to ensure that the local community welfare is safeguarded, eight members of the DAOA have invested significantly in the communities living near the mines, extending their sphere of influence up to 25 square kilometres away from the mine sites.

Encouragingly, the DAOA's positive experience has inspired other small-scale coal mining enterprises in Duyun to follow their lead. In fact, after actively promoting the cooperative's benefits to local coal mining enterprises, a group of coal mine operators in Duyun have joined together to form a successful mining cooperative.

The DAOA experience clearly reflects that cooperative-style management systems are an extremely effective way for small-scale mine operators to run their mines. Independence from larger companies, and a personal stake in the local community and the environment means these operators are willing to take bigger financial risks by investing back into activities outside the scope of the immediate mine operations.

In both China and on a global scale the DAOA experience acts as a model example of how the small-scale mining industry can be profitable and at the same time ensure mine safety, environmental rehabilitation, community welfare and optimal resource utilisation efficiency. Hopefully other ASM operators across China will follow the DAOA's lead in the years to come.



Members of the DAOA discuss management strategies at a monthly meeting, Niujiatong Mining Area, Duyun County, August 2-6 2006

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**Artisanal and Small-Scale Mining (ASM) in Asia-Pacific Portal** <http://www.asmasiapacific.org>

### ASM Asia-Pacific Case Study Series

This series of case studies documents concrete examples of equitable, effective, and sustainable local-level partnerships including small-scale miners or their communities as a guide to develop better policy and practice in the Asia-Pacific region.

The project has been led by Kuntala Lahiri-Dutt. The case studies have been edited by Joel Katz and designed by Rachel P Lorenzen.

### Artisanal and Small-Scale Mining (ASM) in Asia-Pacific Portal

The ASM Asia Pacific Portal is the public interface of a loose network of individuals and institutions working on poverty eradication, development and livelihoods in Artisanal and Small-scale Mining (ASM) in the Asia-Pacific region.

The portal's mandate is to disseminate knowledge about ASM in the Asia-Pacific, to document best practice in community development and environmental management, and to promote fellowship and cooperation among stakeholders interested in poverty eradication and sustainable development.