

**Working Paper on Social-Ecological Resilience Series  
No. 2011-013**

**Resilience as a Way of Life in Gwembe Valley**

**By**

**Elizabeth Colson**

**April 2011**

**Vulnerability and Resilience of Social-Ecological Systems**

RIHN Research Project E-04

**Research Institute for Humanity and Nature (RIHN)**

Inter-University Research Institute Corporation, National Institutes for the Humanities

大学共同利用機関法人 人間文化研究機構  
総合地球環境学研究所

**Working Paper on Social-Ecological Resilience Series  
No. 2011-013**

## **Resilience as a Way of Life in Gwembe Valley**

**By**

**Elizabeth Colson**

**E-mail: gwembe@berkeley.edu**

**April 2011**

### **Vulnerability and Resilience of Social-Ecological Systems**

RIHN Research Project E-04



**Research Institute for Humanity and Nature (RIHN)**

Inter-University Research Institute Corporation, National Institutes for the Humanities

大学共同利用機関法人 人間文化研究機構  
総合地球環境学研究所

## **Abstract**

Harsh environments test human ingenuity. Survival requires adaptability which means that people must be flexible, innovative, versatile and self-reliant. For the last millennium, Tonga-speaking people have inhabited Gwembe Valley in southern Zambia and nearby Zimbabwe. Over the years they created a mixed economy that allowed them to survive drought, floods, and other challenges. Survival techniques included multi-cropping, development of drought-resistant strains of crops suitable to local conditions, and the cultivation of social ties that gave access to the resources of adjacent regions.

**Key words:** Environmental Stress, Drought, Survival Techniques, Innovation, Resettlement, Experimentation, Social Networks, Trade, Gwembe Tonga,

## **要約**

厳しい環境は人間の創造力を試している。生存には適応能力が必要とされ、人々は柔軟で、革新的で、融通が効き、自立的でなくてはならない。過去千年の間、トンガの人々はザンビア南部のグウェンベ溪谷とジンバブウェに暮らしていた。長い年月をかけて、彼らは複合的な経済を作り出し、干ばつや洪水、その他の困難を生き抜いてきた。彼らの生存技術には、複数の作物を栽培することや、地域の状況に適し耐乾性の強い作物を栽培すること、そして近隣地域の資源にアクセスするための社会的紐帯の構築などが挙げられる。

**キーワード：**環境ストレス、干ばつ、生存技術、イノベーション、実験、社会ネットワーク、交易、グウェンベトンガ、再定住

Gwembe Valley is a harsh environment – this is true throughout its extent despite differences in elevation, soils, water resources and biota. It was so prior to 1958 (Scudder 1962) when the building of Kariba Dam on the Zambezi River flooded much of the lower levels of the Valley. It is probably even more so in the 21<sup>st</sup> century. Rainfall is low, temperatures during the hot season are blighting, droughts have become increasingly frequent, fertile soils were largely to be found along the Zambezi's meanders or in the deltas of the Zambezi's tributary rivers and are now under the waters of Kariba Lake, erosion is depleting the remaining arable soils and makes difficult the maintenance of roads, malaria and other insect-vector diseases are common as is tuberculosis, while today HIV/AIDS probably infects at least 16% of the population. To survive and sometimes even prosper in such an environment takes intelligent observation, flexibility, foresight, versatility, opportunism, and above all both the knowledge that humans can recover even from such things as starvation periods or the loss of kith and kin and the determination to survive whatever the odds.

Despite its difficulties, the Valley has been occupied by humans for millennia and by Tonga-speakers since probably around 1,000 AD. In 1949, I found residents in large villages associated with delta or meander soils close to the Zambezi proudly proclaiming themselves People of the River (*basimulongo*) and pleased with the fact that they had their own way of life whose exuberance spilled out on occasions into dances that drew in all the people of a neighbourhood. Even those settled in smaller enclaves in the hills often seemed content with their lot. Many had tried life on the Plateau where they had kin but decided that life in Gwembe Valley was better, difficult as it was. Labour migrants abandoned town clothes and town ways when they settled back into village life. In the 1940s permanent outmigration reflected population pressure on available arable land, endemic since the early 1930s. By then, areas depopulated by raiding parties in the latter half of the 19<sup>th</sup> century (Makololo, Lozi, Chikunda and Ndebele) and by various epidemics again faced land shortages fueled by birth rates that more than compensated for high death rates (Clark et al. 2001). Competition intensified for delta or meander zone fields or for fields on the Zambezi banks whose soils were capable of almost continuous cultivation. Those who lost out moved into the escarpment hills or to the tsetse-free Plateau where plough agriculture introduced by missionaries in the 1910s replaced shifting slash-and-burn agriculture when a market for maize developed with the opening of the Northern

Rhodesian copper mines in the 1920s and 1930s. Then men ambitious to undertake cash-cropping moved westward to take advantage of new possibilities associated with the coming of the railroad, the highway, trading hamlets, and growing urban centres.

### **Versatility and Willingness to Innovate**

Those who chose to stay in Gwembe Valley then acquired a reputation of being backward adherents to earlier life styles, prepared to endure hunger and other deprivations rather than change. Their willingness to accept changes that seemed advantageous was masked by their refusal to abandon proven survival techniques that had carried them through bad years as well as good. This was one aspect of their resilience, i.e., their ability to maintain themselves over the long run under conditions that tested human ingenuity and toughness (Colson 1979).

### **Self-Reliance and Resilience**

Life in the Valley required flexibility, the exercise of judgment, and a willingness to use any available resource if people were to survive and recover from bad times. Gwembe people learned to respond to particular circumstances rather than follow unchanging routines. Their freedom to choose and to shift from one possibility to another, however, was linked to the expectation that individuals were free to make choices according to what they see as their own best interests. This was linked to the lack of hierarchy so characteristic of their society and to the autonomy given to individuals to plan and take responsibility for ensuring survival. The egalitarian social order the Tonga had evolved put a premium on self-reliance. The priority they gave to individual freedom to decide and act with a minimum of external control was summed up in their adage, Each person, (his or her) own law. People did not like to be told what to do and withdrew cooperation if they thought themselves under coercion. The reverse of this lack of hierarchy was the absence of authorized leaders who could organize people for some joint effort. When asked to whom they looked for guidance, the usual answer was, 'It would depend on what I wanted advice about'. They recognized and respected expertise and looked to those with special skills to see what they were doing but adopted only what suited them. Even late into the 20<sup>th</sup> century they looked on the chiefs first appointed by the British South African Company at the beginning of the century as government chiefs and saw no reason why such persons should have the right to tell them what to do. Rarely

could someone expect to be able to direct the activities of others than his immediate family: a man's most secure work force lay in his wives and immature children. The mobilization of larger work groups depended upon reciprocity in labour or the provision of bountiful hospitality.

Despite the emphasis on self-reliance, it was common knowledge that even the most independent needed to be able to turn to others for assistance in some activities or in difficult times. They preferred to cultivate individual links through kinship or other devices that gave them claims on selected people in their own vicinity who could be summoned for house building or help on other occasions. As individuals they also cultivated links with a scatter of kin or bond friends living elsewhere who might be able to provide support in a bad year or if they ran to escape difficulties at home. Dispersal rather than community mobilization was a preferred survival technique.

Communal activities were largely ritual in nature and incumbent only on the people of a neighbourhood, each neighbourhood having its own ritual shrines and ritual leaders (Colson 2006). These regulated activities of the agricultural year (especially those associated with the growing of millets and sorghums, the harvesting of certain wild crops, the initiation of certain kinds of hunting and fishing) and also provided for the maintenance of good relations with the land on which all depended. The last included protection of communal shrines from encroachment. Rituals stressed the need to maintain continuities with the past but individuals were still free to experiment with new crops and other productive activities without consulting others. An innovator was threatened only if an action was diagnosed as angering the spirits that watched over the land whose displeasure was indicated by bad rains, insect infestations, or other calamities that affected those residents in the locality. Otherwise their fellows preferred to observe, on occasion with ridicule, but usually with a willingness to be convinced if a new activity brought desirable results. Since most activities basic to subsistence were learned in preparation for normal adulthood, fellow villagers considered themselves good judges of the desirability of innovations, taking into account available resources including labour, alternative sources of supply and environmental conditions that made for great uncertainty. On the other hand, the innovator usually felt no compulsion to share a discovery. Often enough, knowledge was passed on only to a chosen successor or only for a substantial payment. I have heard Gwembe men bemoan lost knowledge: 'we experiment and make wonderful discoveries

but then we don't want to share these with others'. This they said differentiated them from the Europeans who thought knowledge gained should be taught to others.

### **Versatility**

Gwembe Tonga willingness to innovate has been demonstrated many times. The rapid spread of cattle herds and resort to ox-ploughing in the 1950s when cattle could be protected against trypanosomiasis is one evidence of this. So is the equally rapid spread in the 1980s and 1990s of domestic guinea fowl once these had been introduced into Zambia. Cropping patterns also reflected this mixture of the experimental and the tried.

Gwembe farmers did not abandon the old staple crops of sorghums and millets, associated with much of the ritual of the agricultural cycle, when Plateau farmers switched to maize as their primary crop, but this was not because of the ritual importance of these crops. Farmers knew it was risky to depend on maize as a staple, given their soils and the uncertainty of the rains and the difficulty of importing food when local supplies failed. It was wiser to give priority to crops that had more certain outcomes under a variety of weather conditions. Maize was a luxury, a welcome addition to their cropping system as it had been since its introduction via the Portuguese in the 16<sup>th</sup> or 17<sup>th</sup> century, but it also gave them added protection. So, after resettlement in 1958 and against the advice of the colonial agricultural service, they continued to grow maize both because they liked its taste and the ease with which it could be processed into meal and because maize ripened earlier than the more drought resistant sorghums and millets. This shortening of the hunger period, for many, was reason enough in itself to plant maize. Over the years they selected seed to develop quick ripening drought resistant maize varieties adapted to their soils and rainfall, just as they continued to develop their own breeds of sorghums and millets. But they knew that they could not depend upon maize as the primary subsistence crop nor would an abundant maize harvest be disposable given the limited local market when harvests were good.

This openness to the new without abandoning proven practices resulted in a complex agricultural system based on the expectation that in any one year one or more staples might fail. Men and women observed, evaluated, and often adopted what they saw others doing and then experimented further. Travelers to other areas looked for and brought home new seeds or plants to see how these fared under local conditions and how

their requirements of soil and water competed with other uses of the land. Novelty in itself was attractive but no guarantee that an innovation would prove advantageous in the long run and some possible crops were rejected without a trial because they took too many years and required too much care before they produced a crop. Fruit trees and other trees that require years of care before producing were rarely planted, whereas people willingly found room to plant a few seeds of a new variety of grain, pulse or cucurbit. If the first trial produced poor results, the variety was unlikely to be planted again. Crops viewed as possible cash crops were also dropped if an efficient market failed to materialize in the first year. The limited resources of the small production/consumption teams responsible for provisioning a homestead left little margin for evaluating potential returns over a sequence of years. Crops had to prove themselves to remain in the repertoire, being evaluated against such things as productivity and acceptability to local consumers or to external buyers who could be relied upon to buy and to buy at a price competitive with other uses of land and labour.

Tonga-speakers were agriculturalists when they first moved into Gwembe but they never relied on agriculture even when this included small stock and later cattle. Instead they kept their options open and refused to become specialists dependent on a single activity. Hunting and fishing and the collection of honey provided foodstuffs year round but were especially important in years when crops failed. Later the sale of honey, dried fish, bush meat, hides, and elephant ivory supplemented cash incomes. The great variety of wild plants used as food (leafy greens, fruit, nuts, seeds, tubers and roots), medicines or for other purposes are evidence that years of close study and experimentation had produced detailed botanical appraisals of the various plants available locally. Scudder (1971) found the Tonga using a wider range of plants than the San of Botswana, including plants requiring much processing to remove toxins before they became safe for human consumption. The Tonga thought of the last, along with wild grass seeds, as famine foods: only when faced with hunger were they willing to undertake the laborious processes associated with their conversion to food.

Uncultivated bush provided other requisites, including building and craft materials. In their appraisal of resources, Tonga therefore weighed the advantages of a multitude of possible alternative uses of land and labour.

## **Foresight**

Planning for the future was often short-term, but people expected to husband food resources from harvest to harvest. Seed had to be selected and stored. Surplus food was processed for use when fresh food was in short supply. To ensure supplies of relish during the dry season, Gwembe women dried the leaves of cucurbits and some trees and other wild plants. They also dried okra, cucurbits, mushrooms, termites, meat and fish. These were stored in granaries along with grain or in pots in the dwelling house. Smoke from the dwelling hearth or from cooking fires placed underneath granaries helped keep down insect infestation. Tobacco cones were interspersed with foodstuffs, again as an insect deterrent. In general, however, grain, and especially maize and sorghums, became insect infested after a year or so of storage. Only in southern Gwembe, in the Mweemba area was long-term storage attempted. Here, where population pressure was greatest, people molded large clay bottle granaries that were sealed after filling and opened only when other grain supplies had been exhausted. Grain so contained was expected to remain edible for two years or more. After resettlement, such grain stores were no longer constructed. Some said their fields after resettlement produced too little grain to last until the next harvest and long-term storage containers lost their purpose. They may also have preferred to invest their labour elsewhere now that road transport was available for the import of grain or meal.

Besides food stores, people had other forms of saving that could be traded for food in times of emergency. Prior to 1958, most Gwembe Tonga appeared to have few possessions other than stock. Many were wealthy in their own eyes. It was common practice for instance to invest extra cash or produce in purchasing hoe and axe blades and iron pots. These had long-term value because they could always be sold or traded for grain, small stock, or cash. Officials planning the logistics of the 1958 resettlement were confounded as granaries and sleeping huts gave up their contents of grain, dried produce, medicines, tobacco, clay pots of different dimensions calibrated to different uses, iron pots, baskets, fish traps, hoe blades, scraps of metal, spears, shields, drums, pipes, beads, lengths of wood for hafts, etc.

Such things gave people assurance that they had resources to see them over difficult times, but they trusted more to their acquired skills than to possessions, knowing that if necessary they could start again if they had access to arable land and to seeds.

### **Responsiveness to Markets: Appraisal and Choice**

In allocating time and other resources, Gwembe Tonga took into consideration such things as marginal utility and comparative advantage as they did when they entered cash markets in the 20<sup>th</sup> century. This has not always been appreciated by strangers intent on ‘developing’ the area who have usually been ignorant of local assumptions about what is profitable and acceptable and unaware of important aspects of the local economy. During the first half of the 20<sup>th</sup> century, for instance, Gwembe Tonga capitalized on the comparative advantage given them by their isolation from close supervision by colonial officials who rarely visited them and knew little of what they were doing to develop an export trade in locally grown tobacco and cannabis to nearby regions.

By then tobacco was an old crop among the Tonga, both in the Valley and on the Plateau, as evidenced by the number of local varieties and differences in cultivation techniques. It was probably introduced via the Portuguese in the 16<sup>th</sup> or 17<sup>th</sup> century. Like cannabis, an earlier introduction from the East Coast, it was smoked in clay pipes, reeds and water pipes or made into snuff. Both crops were grown throughout the region with local production meeting local demand until the imposition of colonial rule at the end of the 19<sup>th</sup> century. Then both cultivating and trade in cannabis were declared illegal. The prohibition worked best in areas where administrative supervision meant that cannabis could no longer be grown without considerable risk to the grower. The result was a growing market for imported cannabis, a lucrative niche filled by Gwembe growers.

In Gwembe Valley, rarely visited by administrators prior to the 1950s, chances were good that growers could harvest a cannabis crop undetected. Export was feasible despite the absence of roads or wheeled transport given the sales value of a load transported to the railway line on the backs of men visiting kin or of labour migrants who marketed their load in their places of destination, often the new towns of Zambia and Zimbabwe. Or growers disposed of their crop through established systems of bond friendships negotiated with Tonga on the Plateau or with traders from the west through which tobacco and cannabis flowed in a form of gift exchange (Colson 1962). Frequently the trade in cannabis was combined with the trade in tobacco, the tobacco serving as a cover to the illegal cannabis. Tobacco was marketed in the towns or to workers on the European farms near the railway line or disposed of among Plateau Tonga after these abandoned tobacco cultivation to concentrate on maize agriculture when a market for maize, at a price

guaranteed early in the growing year, became established in the 1930s. Many tobacco users continued to prefer tobacco grown and processed in Gwembe to the commercial tobacco produced by European growers: it was cheaper, it was stronger, and it could be stored for long periods and then if necessary be resold. Both tobacco and cannabis were sold for cash, or, if disposed of through bond friends, for payment in kind. When left with a Tonga bond friend, multiple deliveries might eventually bring a return gift of a cow. Cattle so acquired were usually left on the tsetse-free Plateau with kinsmen or bond friends to be available when needed. Such holdings were the source of the rapid build up of cattle, especially ploughing oxen, in the Valley beginning at the end of the 1940s when it became possible to immunize cattle against trypanosomiasis and the building of roads encouraged people to grow bulk crops for now reachable markets.

Gwembe producers regarded cannabis and tobacco as equally acceptable crops although cannabis was less labour intensive and it became more profitable after the colonial administration prohibited its growth. Both crops could be grown since they did not compete for field space given their different soil requirements and both were in demand locally. Moreover, cannabis was a rains crop while tobacco was grown during the dry season in fields moistened by river water. The illegality of cannabis was considered an administrative foible of the Europeans of no particular importance so long as one could escape detection. In the same spirit Gwembe villagers also dealt in other now illegal commodities: elephant ivory, lion and leopard skins, and dried meat of many kinds in demand in areas on the Plateau where game had disappeared due to population growth and the spread of guns. Ivory and skins found their market among European and Indian traders settled along the railway line while dried meat sold well in the villages, often being traded for maize, as were cannabis and tobacco, the maize then being carried back into Gwembe in hunger years or sold for cash on the railway line.

Conditions varied enough throughout Gwembe Valley for a degree of specialization to emerge across localities. By the mid-1950s, tobacco had been largely abandoned in Mwemba Chieftaincy in southern Gwembe where the dense population made it difficult even in a good year to grow enough food on the available soils. Maize and tobacco competed for space in the small fields of the dry season and people preferred to grow food that sustained them through the hunger months rather than grow an export crop given the difficulties they faced in importing grain or meal. Elsewhere tobacco continued

to be grown for export until 1958 when the flooding of the valley eliminated the soils along the river where it had once been a prime dry season crop. Thereafter, producers experimented with new fields cut from the bush and with the possibilities of growing hybrid maize or cotton as newly exportable commercial crops whose cultivation was supported by government services or by corporations interested in obtaining commodities in demand by urban consumers or suitable for international markets. Tobacco cultivation was abandoned over much of the Valley, smokers now relying on Plateau traders who visited them with loads of leaf tobacco bought from the large-scale tobacco farms of the Plateau. The Lusitu area in northern Gwembe was exceptional in that a few men with access to river soils continued to grow a little tobacco for sale though suitable soils were largely preempted by women to grow vegetables sold in the small population centres that began to appear in the Valley in the 1960s and 1970s. In 2010, a rapid rise in tobacco prices paid to the few remaining tobacco growers convinced Lusitu farmers that tobacco brought a better return than vegetables or the labour intensive cotton (that also required costly inputs and so increased the risk of loss) and tobacco once again became a preferred crop.

After resettlement, cannabis too became a less preferred crop in many areas of Gwembe when the Valley became more exposed to outside inspection and supervision. A little continued to be grown almost everywhere, usually interplanted with other crops where it might escape notice. A few areas rarely visited by officials expanded cultivation as external demand increased and it became feasible to export by lorry. By the 1970s, much of their produce was said to reach European markets via the airlines. There it found favour because of its high quality. It continues to do so and cannabis continues to make a substantial contribution to Gwembe's hidden economy, along with other 'illegal activities', including some that have emerged in the last 50 years.

These include trade in gemstones mined by diggers who have no license or purloined from amethyst and garnet mines capitalized by foreigners, trade in poached dried game meat (sometimes obtained in Zimbabwe), theft and export of stolen livestock, or the smugglers' trade that profits from Gwembe's proximity to Zambia's international boundary with Zimbabwe. Not everyone participates in such activities even in areas that offer the best opportunity for profiting from them, but probably few would disapprove of those who so profit.

Men and women turn from one to another possibility, legal or illegal, according to what they see as advantageous under existing foreseeable circumstances. This is one reason why the Gwembe real economy is not subject to quantification but it also provides a partial explanation of how and why Gwembe people have been able to continue to survive in the Valley despite the increasing frequency of bad harvests.

### **Triage and Survival**

Bad years have been common enough to Gwembe life and the worst ones meant that despite their toughness and local knowledge and their skill at using those upon whom they had some claim, not all survived. When severe hunger hit, people were prepared to triage. In the early years of the 20<sup>th</sup> century, small children might be traded for food, while at the end of the 20<sup>th</sup> century girls were sent as wives to men who could support the family with food. Able bodied men and boys left the area in search of work and food. Elderly dependents were told to find refuge elsewhere with other kin so that the able-bodied and the children might eat. Sometimes elderly or disabled dependents were denied food and left to starve. Men, women, and children stole food wherever they could, ignoring the privation this caused their kin and neighbours. The survivors lived with the knowledge that they themselves or those with whom they interacted daily had kept alive by their own determination to survive whatever the consequences for other people. Hunger periods thus left behind bitter memories of actions taken by oneself and others that had to be suppressed if people were again to live together as members of a community, but these same memories gave knowledge of ultimate survival techniques that made survival possible when famine struck again.

With the coming of better times, people knew, they would recover strength. They would build new homesteads. They would have more children. Life would go on. This is the ultimate test of resilience.

**Acknowledgements:**

I have been involved in research first among Plateau and then among Gwembe Tonga of Zambia since 1946, but most of the data for this article are drawn from the long-term study of the Gwembe Tonga initiated by Thayer Scudder and myself in 1956. The study was first supported by the Rhodes-Livingstone Institute (now the Institute for Economic and Social Research in the University of Zambia), and later by the Social Science Research Council, the Guggenheim Foundation, the National Science Foundation. Over the years we have become indebted to many people in Gwembe and elsewhere in Zambia, including the many who have served as village research assistants. Mary Elizabeth Scudder and Lisa Cliggett, who have also worked in Gwembe, gave access to their own field notes. I am grateful to Thayer Scudder, Eugene Hammel, and Anya Royce for reading and commenting on an earlier draft.

## References

- Clark, Sam, et al. 1995. Ten Thousand Tonga: A Longitudinal Study from Southern Zambia: 1956-1991. *Population Studies* 49:91-109.
- Cliggett, Lisa, et al. 2007. Chronic Uncertainty and Momentary Opportunity: A Half Century of Adaptation among Zambian Gwembe Tonga. *Human Ecology* 35:19-31.
- Colson, Elizabeth. 1962. Trade and Wealth among the Tonga. pp. 601-616 in *Markets in Africa*. Paul Bohannan & George Dalton, eds. Evanston, IL: Northwestern University Press.
- 1979. In Good Years and in Bad: Food Strategies of Self-Reliant Societies. *Journal of Anthropological Research* 35(1):18-29.
- 2006. *Tonga Religious Life in the Twentieth Century*. Lusaka: African Book World.
- Scudder, Thayer. 1962. *The Ecology of the Gwembe Tonga*. Manchester: Manchester University Press.
- 1971. *Gathering among African Woodland Savannah Cultivators*. London: Butler & Tanner.

## List of Working Paper

- No. 2008-001 Moses Mwale, *Synthesis of Soil Management Options for Better Targeting of Technologies and Ecological Resilience under Variable Environmental Conditions*
- No. 2008-002 Thamana Lekprichakul, *Impact of 2004/2005 Drought on Zambia's Agricultural Production and Economy: Preliminary Results*
- No. 2008-003 Gear M. Kajoba, *Vulnerability and Resilience of Rural Society in Zambia: From the View Point of Land Tenure and Food Security*
- No. 2008-004 Lawrence S Flint, *Socio-Ecological Vulnerability and Resilience in an Arena of Rapid Environmental Change: Community Adaptation to Climate Variability in the Upper Zambezi Floodplain*
- No. 2008-005 Tetsuya Nakamura, *The Livelihood of 'Escarpment Tonga': A Case Study of One Village, Southern Zambia*
- No. 2008-006 Chihiro Ito, *Re-thinking Labour Migration in Relation to Livelihood Diversity in African Rural Area: A Case Study in Southern Province, Zambia*
- No. 2009-007 Matheaus Kioko Kauti, *Rural Livelihood Security Assessment for Smallholders Undergoing Economic Changes and Agro-Climatic Events in Central Kenya*
- No. 2009-009 Gear M.Kajoba, *Vulnerability of Food Production Systems of Small-Scale Farmers to Climate Change in Southern Zambia: A Search for Adaptive Strategies*
- No. 2009-010 Chileshe L. Mulenga, *Resilience of Rural Households and Communities to Economic Shocks, HIV/AIDS and Recurrent Droughts: The Case of Households and Communities in the Mwami Area, Chipata, Zambia*
- No. 2009-011 Bennett Siamwiinde Siamwiza, *An Historical Analysis of Vulnerability and Resilience in a Semi-Arid Region of Zambia*
- No. 2009-012 Chewe M. Chabatama, *Ecological Adversity and Food Supply in Northwest Zambia*
- No. 2011-013 Elizabeth Colson, *Resilience as a Way of Life in Gwembe Valley*

## **Vulnerability and Resilience of Social-Ecological Systems**

Resilience Project Home Page: [www.chikyu.ac.jp/resilience](http://www.chikyu.ac.jp/resilience)

社会・生態システムの脆弱性とレジリアンス  
レジリアンスプロジェクトHP: [www.chikyu.ac.jp/resilience](http://www.chikyu.ac.jp/resilience)

## **Research Institute for Humanity and Nature (RIHN)**

Inter-University Research Institute Corporation, National Institute for the Humanities

457-4 Kamigamo Motoyama, Kita-ku, Kyoto, 603-8047, Japan

[www.chikyu.ac.jp](http://www.chikyu.ac.jp)

大学共同利用機関法人 人間文化研究機構

総合地球環境学研究所

〒603-8047 京都市北区上賀茂本山 457-4

[www.chikyu.ac.jp](http://www.chikyu.ac.jp)