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The Social Impacts of the Construction of Mpudzi Dam (2) in Zimunya Communal Lands, Manicaland Province, Zimbabwe

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Abstract

The aim of the study was to determine the social impacts of the construction of Mpudzi Dam (2) in Zimunya Communal Lands of Manicaland Province of Zimbabwe. Triangulation was used as a research strategy that involved the collection and analysis of data using a number of techniques. A questionnaire was instituted through canvassing to systematically sampled heads of households as well as in-depth interviews with key informants and field observations supported by a checklist. Key negative impacts of the dam included the displacement of families, the relocation of gravesites, the destruction of plant resources and the loss of arable and grazing land. Though attempts were made to compensate the affected families, this was low when compared to the time and effort of setting up homesteads. The construction of the dam rekindled leadership disputes among the village heads as well as family disputes related to unwanted pregnancies. Employment was created for local people who were involved in stone picking and providing security to campsites. The dam has created a reliable source of water for irrigation, fishing and possible recreation facilities. The construction of the dam lacked comprehensive consultation and the locals had to follow regulations from the authorities with minimal input. No EIA studies were done prior to the construction of the dam even though such activities are prescribed under the EIA policy and are mandatory under the Environment Management Act of 2003. The responsible authorities should embark on a wide based and comprehensive consultation with a view to produce a workable environmental management plan for the dam.

Key words: Dam, Environment, Environmental Impact Assessment (EIA), Impact, Social impact, Sustainable development

Background

The global response to the management of water resources has been to put in place water harvesting techniques to ensure its availability when required. The construction of dams is the most popular and reliable method to supply water to growing urban areas, hydroelectric projects and for irrigation farming in most countries. This has often led to short, medium and long term direct and indirect impacts on the social environments. Despite the global movements and proclamations towards sustainable development, construction of dams in most countries has resulted in the disruptions of the social fabric of the affected communities. The common risks that the communities have been exposed to are homelessness, landlessness, margialisation, food insecurity and social disintegration. Dams are vectors of change and thus it is critical to determine the spatial and temporal dimensions of the social impacts of their construction.

The most obvious impact of dam construction is the loss of productive land beneath the reservoir and in Africa this varies greatly. Some classic examples include the Akasombo Dam, (8 500 $km^{2)}$ and Kainji Dam, (1 200 km^2) in Ghana, Lagdo Dam (7 000 km^2) and Bakori Dam (120 km^2), (Adams, 1992). In Zimbabwe Manyuchi Dam covers an area of 33 km^2, Mazvikadei Dam, 23 km^2, Osborne Dam 26 km^2, proposed Kunzwi Dam is estimated to cover 9.85 km^2 and Gwayi-Shangani Dam was calculated to cover 104 km^2. This magnitude of arable land lost to dam construction disrupts the social fabric of the affected communities. Most of the dams are underutilized and the infrastructure is put to waste. Displaced families are dumped in hostile environments. They get frustrated and with time; they encroach back to their original areas and settle along dam shores threatening them with siltation. If benefits outweighed costs prior to construction why then is it that such magnificent structures are put to waste? Key to this scenario is the use of dam construction as campaign tools where political ambitions override economic reason. For most peasant communities' loss of farmland has generally more severe consequences than the loss of their houses. Recent developments in environmental management compel that environmental impact assessments be conducted prior to the construction of a dam.

The most documented examples of the displacement of people are the 86 000 Tonga people who inhabited the Zambezi Valley and were displaced by the construction of the Kariba Dam (Masundire, 1994). In other parts of Africa the Akasombo in Ghana displaced 84 000 people and the Kainji 50 000 people, the Kasson Dam in the Ivory Coast 85 000 people and the Aswan dam in Egypt, 120 000 people (Adams, 1992). This has often led to the deepening of poverty among communities as they are left out of the dam management plans. In the majority of cases

compensation is given for house structures only and some assistance to move to new areas and on few occasions would you find governments assisting their people to construct new homes. The construction of dams in Zimbabwe has usually necessitated the relocation of people. Recent examples are the displacement of people prior to the construction of Osborne Dam in Manicaland Province where 700 families were relocated to areas more than 100 km away in Headlands Makoni District and were not in a position to benefit from the dam. Problems related to the relocation of people include the lack of adequate finance for compensation, loss of family heritage and shrines, which are often important in African traditional cultures, and having to settle in new areas often lacking in basic infrastructure such as schools, health and communication facilities, (Masundire, 1994).

In Africa the construction of dams has led to the disruption of many traditional production systems including recession agriculture, livestock management and fisheries, (Adams, 1992). The basic premise is that economic benefits and human welfare should constitute part and parcel of development process of water projects, otherwise this will result in situations of growth without development (Lewis, 1991). Adams (1992) gives a summary of the socio-economic impacts of dam construction in Africa. The construction of a dam along the Sokoto River in Northwestern Nigeria in 1978 led to the failure of flood for farmers on the downstream floodplain. Farmers in the valley depended on the annual flood of the river to irrigate their crop and to leave enough moisture in the floodplain soils to allow dry season cultivation**.** In 1989 there was no water at all in the river between 30 July and 8 September. It was a disaster for the farmers. The project laid aside earlier plans for downstream releases and an integrated role for the reservoirs.

Lake Volta in Ghana was intended to steer economic development but the opposite was true after its construction. There was inadequate land for the displaced people, the land demand accelerated deforestation, and led to decline in cocoa production (Heath, 1990). Dam projects fail to realize the intended benefits for instance the Carbora Bassa in Mozambique, the development of the lake for sailing or fishing was not realised due to the scattered nature of the local populations and fluctuations in water levels. This hindered agricultural development (Heath, 1990; Goldsmith and Hilyard, 1986). A study of 50 dams in India (Lewis, 1991) revealed that the average overall benefits were only 50% of the initial forecasted figures. In addition 11 million people were displaced throughout the country to make way for dams (Zinyama, 1995). This further compounded the debt problem as the country borrowed from international financial institutions in order to finance the construction of dams (Barghouti and Le Moigne, 1991).

Human civilisation has evolved along rivers (WCD, 2000) and classic examples are the Mesopotamia between the Euphrates and Tigris Rivers and along the Nile River. These locations have valued cultural and archaeological sites and the construction of dams has resulted in the inundation of some of these sites. Rivers are also regarded as sacred sites along which rituals are performed and some of these are difficult to identify unless the locals are consulted prior to the construction of the dam. Furthermore, the knowledge about the importance of these areas was only passed down through oral tradition such that their specific locations may not be known to the young generations. The Aswan High Dam affected the ancient city of Nubia and the Coa Dam in Portugal was abandoned after Palaeolithic engravings were found, (WCD, 2000). The list of cultural heritage sites affected by the Massive Three Gorges Project in China has grown from 42 to 13 000 and in the USA native tribes on the Colorado and Columbia Rivers threatened legal action over dams that threatened their ancient burial grounds and sites, (WCD, 2000). In India's Narmanda Valley archaeological and iron smelting sites were uncovered whilst in Panama the Madden Dam revealed thousands of newly exposed artifacts, (WCD, 2000). Archeological sites can be difficult to identify if the local people are not involved in the planning of dams.

The construction of dams has always involved the relocation of graves and cultural sites in Zimbabwe. This has been always a source of anguish and protracted conflicts, mainly due to lack of consultation. The information related to the spiritual features of the area of study can only be obtained from the local elders. The Osborne Dam across Odzi River in Manicaland Province of Zimbabwe is one example where communal people resisted to move because they have been in the area for a long time and had a close relationship with graves of their relatives and important cultural and historical sites. In contrast the EIA for the proposed Kudu Dam in Gokwe established that the locals were willing to move from the dam impoundment area. People in this area moved from Masvingo and other over-crowded districts in the south of the country during the 1950s and early 1960s (Zinyama, 1995). Thus, there was not enough time for the sites to become historically or culturally significant to the extent that the people would refuse to leave them. Another view of this cooperation by the locals can be linked to the shortage of water in the area and the mandatory nature of the government rural development policy. Forced displacements lead to social disintegration and the loss of common property resources, increased mortality, and above all the risk of food insecurity. Though evidence point to the fact project planners are aware of the impacts of dam construction evidence on the ground indicate that an all involving comprehensive and coordinated study of these impacts has remained a myth in Zimbabwe.

Objectives

General Objective

The study intended to assess the social impacts of the construction of Mpudzi Dam (2) in Zimunya Communal Lands, in Manicaland Province.

Specific Objectives

The objectives of the study were threefold:

- To determine the impacts of Mpudzi Dam (2) on arable land, homesteads, cultural sites and gravesites.
- To establish the type of jobs created by the construction of Mpudzi Dam (2)

The Study Area

Mpudzi Dam (2) is located in Munyarari and Chitora Wards of Zimunya Communal Lands in Manicaland Province. It covers Musabayana Village, and Mukwindidza village, Mambwere village to the eastern margin of the dam and Jaricha village to the Northern side of the dam. It is sited 38 km south of Mutare and to the east of the Mutare-Masvingo Road. It is located in hydrological Zone E; sub-zone $E0_3$ on Mpudzi River a tributary of Odzi River (Figure 1). The river forms a sub-system of the Save – Runde Catchment. It rises from the western side of the Vumba Mountains and flows in a south – westerly direction for about 40 km to the confluence with the Odzi River. The river cascades down the hilly and rocky terrain and has a drop in gradient of about 572 m in some 29.3 km to the current Mpudzi Dam (2) site (Figure 1).

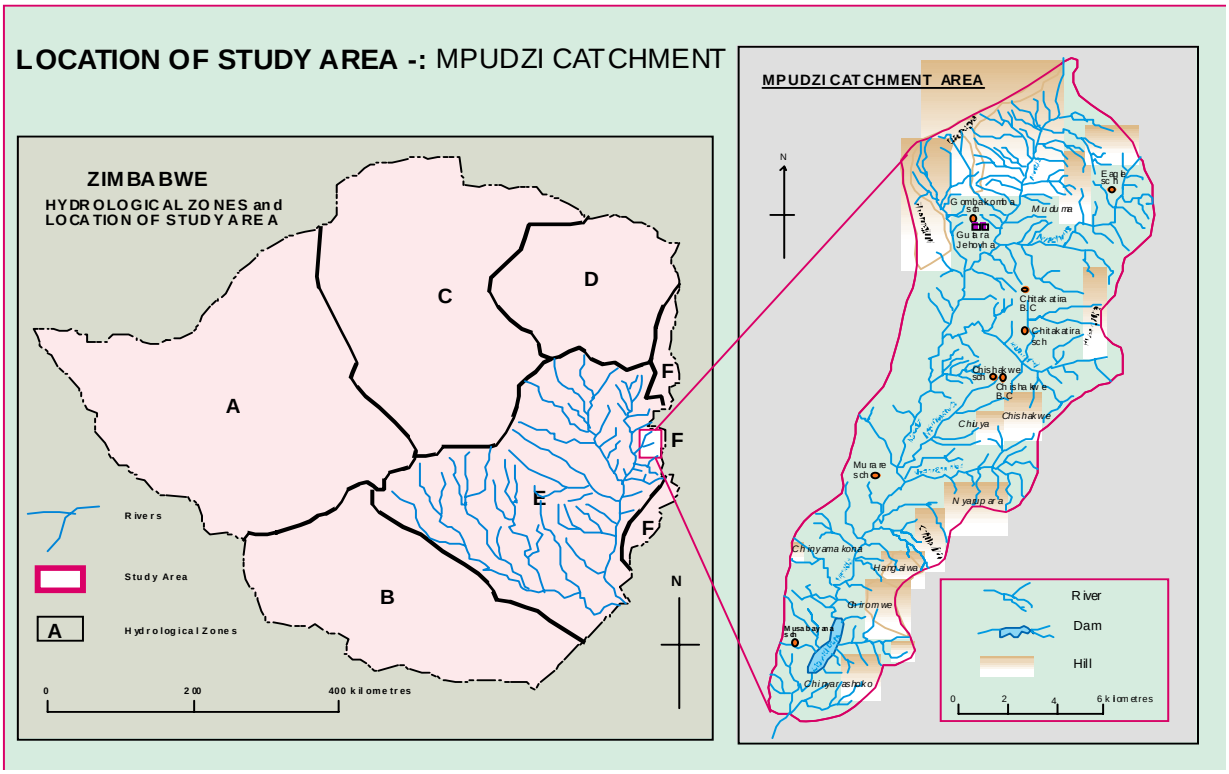

Figure 2: Location of Mpudzi Dam (2) in Zimunya Communal Lands

The river cuts across the four agricultural zones of the country. Agro – ecological planners have defined five natural regions in Zimbabwe according to the amount and availability of rainfall, topography and soils are regarded as secondary factors conditioning the system of land use that is recommended. The dam is located in an area where agricultural potential production is low. The dominant type of farming in the catchment of the dam is subsistence agriculture. Non-arable land is mainly used for grazing under communal tenure. During droughts communities in this area survive on food handouts from the Government and non-governmental organizations like Plan International. A considerable number of children are given education assistance by Plan International. Thus, the communities can be described as poor with limited access to economic resources. In this view the construction of the dam is expected to improve living standards of the communities. The catchment has a limited number of thriving business centers and the construction of the dam has the potential to increase economic activity.

Methods and materials

The study was a non-interventionist descriptive survey of the social impacts of the construction of Mpudzi Dam (2) in Zimunya Communal Lands of Manicaland Province. To thoroughly explore the questions surrounding the benefits and its negative impacts on the social environment it was imperative to solicit detailed data at extremely fine resolution. This necessitated the use of primary data as support to the existing secondary data. A variety of data collection tools were used based on focus group discussions and in depth formal and informal interviews and field observations.

The objective of focus group discussions was to collect views about the dam from the household heads. A household was defined as including those members normally living and eating together at the same home site. This included resident household members who were more or less permanently in the area, as well as other members who worked or resided away part of the time. It was vital to establish knowledge of the participants on the social impacts of the dam on fields, homesteads, cultural sites, gravesites and other properties affected by the construction of the dam. It was also imperative to solicit data on the participants' assessment of the level of compensation and the environmental awareness programmes put in place by the project owners prior to construction, during construction and after construction of the dam. In depth interviews enabled the collection of data from a cross section of stakeholders involved in the construction of the dam. These were conducted with key informants and helped to generate specific technical, social and economic data about the impacts of the dam. Specific data categories collected through this method included a description of the direct social impacts of the dam like, burial sites, cultural sites, arable land, grazing land and the income levels of the local community. This was an open approach aimed at maintaining maximum flexibility so as to obtain as much information as possible. Interviews served as means to gather data through probing the perceptions, attitudes, beliefs and feelings of representatives of organizations about the construction of the dam. These also helped to determine the roles of various organizations during the construction of the dam.

Field observations were conducted at the dam site and helped to verify the actual impacts of the dam to the social environment. To facilitate observation a descriptive checklist of the major social impacts of the construction of dams was prepared. A checklist is simple to apply in the case of limited time and money. The limitation of the method of checklist is that it provides a tunnel vision in exercise and limit consideration to items on the checklist. This method was perceived crucial in identifying direct impacts of the dam though it was difficult to establish the cause effect

relationship. The method was also important in picking the benefits and costs of the construction of the dam. Its limitations were complemented through interviews and questionnaires.

Qualitative data are typically verbal or written descriptive accounts of an issue. Thus, data were analysed by looking for themes and re-occurring issues in the data. These themes were summarized and then compared with the general impacts of the dam as given by the project promoters and as established through field surveys. Thus, social data from the questionnaire and the interviews were edited and coded immediately after the fieldwork. This was done to reconcile data collected by research assistants. The logic of different sets of responses was checked for insincere responses and codes were created for open-ended questions. A listing of the main categories of answers was made and the number of responses recorded against each other. The data generated from the questionnaire was both nominal and ordinal. The number of respondents was determined and the percentage of the total sample computed.

Results and Discussions

The social impacts of the construction of Mpudzi Dam (2)

The entire sample population indicated that gardens were severely affected by the construction of the dam. This was because all the respondents had gardens within the impoundment area of the dam. The popular crops grown in these gardens ranged from vegetables, maize, leguminous plants and others. These were mainly for the sustenance of families and the surplus was sold to the local market. Interviews established that gardens affected by the dam were replaced by a community garden established in Musabayana village.

One community garden was established but as observed from the field no production is taking place as the beneficiaries shun communal production. The individualism that motivated horticultural production prior to the construction of the dam was sacrificed through the establishment of a community garden without full understanding of the ability to cooperate among the members. Other factors related to this are distance to the nearest stream (300metres) and the reluctance to use the borehole. Furthermore, the garden was established in one village whilst no attempt was made to establish gardens in the four villages that were affected by construction of the dam. The siting of the community garden was not done with the knowledge of all the affected families. This can be related to powers that the local leadership derived from the construction of the dam. The result was increased distances traveled by the intended beneficiaries to the garden. Apart from this most families enjoy to own their own small gardens rather than to work as a

community as sharing of produce might create disputes among members. Thee findings confirm thee risks of placelessness and the loss of property as detailed in Cernea's 1995 model.

Landholding sizes in the area are generally small, two hectares per household. The farmers practiced mixed farming on these small plots although the majority produced maize for family consumption. On these plots the average maize output was 500 kg of maize an equivalent of 10 by 50 kg bags of maize. This quantity was not enough to feed a family of six until the next harvest. The size of the land and its sloping nature in the area may make it difficult to irrigate. The land holdings were further divided when some of those displaced were accommodated within the vicinity of the dam. Thus, the impact of the dam on arable land can be summarized as severe. The families that opted to remain in the area found themselves with even smaller pieces of land for crop farming. The same scenario was also observed in regards to grazing land available. Most families herded their cattle around the dam site and along the Mpudzi River. The discussed findings illustrate the risk of marginilisation related with displacements (Cernea, 1995). Families lost economic power and slid on a downward mobility path; to below poverty thresholds. In the short term the construction of the dam brought more loses for those families that did not participate in other capacities during the construction of the dam.

The dam inundated a total of 65 hectares at full supply capacity. This comprises 18. 4 hectares of arable land (Table 4) and 46.6 hectares of grazing land. According to records an additional 17 hectares of arable and grazing land was lost to borrow pits downstream of the dam. The area scraped for core material was the only one with red clay soils that were suitable for flood irrigation. Agricultural potential was also high in this section. The land lost was adequate to settle 30 communal households.

Areas along Mpudzi River provided good grazing land for cattle but parts of it have since been covered by water. Thus, (42%) of the respondents felt the impact of the dam on the size of their grazing land was very severe. Another 6% of the respondents felt the impact was insignificant. Most of the interviewed appreciated the importance of the dam to the availability of water in the area. However, they need the Government to consider the establishment of common grazing areas. The AREX official in the area was of the opinion that some of the people must be moved to new areas so that a manageable number is left in the area given the reduction of farming land. Another approach to the control of the problems caused by the dam is to de-stock so as to preserve the condition of soils and vegetation and to improve the state of the environment around the dam. This notion contrasts the general belief that dams bring benefits to the local community and by large negates the need to put people at the centre of development projects.

The construction of Mpudzi Dam (2) has resulted in the displacement of a number of families. According to Mutare District Council records the dam affected 46 households. One notable benefit arising from the relocation was that some of the displaced families were given bigger plots (5ha) as compared to the average 2 ha each one of them had. Table 1 shows the number of families, the total population in the village prior to displacement, number of families affected, the total population affected and the percentage population affected by the construction of the dam. According to the Zimbabwe Water Authority (ZINWA) and village heads records 46 families were affected in the four villages. This gives a total of 288 people or 15% of the population displaced by the construction of the dam. Musabayana village had the highest number of families and population affected by the dam. This was because most of the affected families were on the impoundment area and close to the river channel. Three quarters of the dam impoundment area lies in this village. The five families affected in Mkwindidza village were on borrowing sites. The areas where core material for the dam was extracted and they had to be moved prior to construction activities.

Table 1: Number of families and total population displaced by Mpudzi Dam (2).

Village	***Number of Families***	***Total Population***	***Population Displaced***	***Families displaced***	***Population displaced (%)***
Musabayana	92	800	168	28	21
Jaricha	58	348	30	3	9
Mambwere	72	450	60	10	13
Mkwindidza	55	340	30	5	9
Total	**276**	**1938**	**288**	**46**	**15**

Note: The average family size for the area is six. Thus, the number of families multiplied by six gives an estimated total population in the village and the total displaced by the dam.

Council officials and local leaders were of the opinion that no major problems were experienced with compensation though some complains were raised by adult children living with their parents under the same household. They wanted to be considered separately from their parents as some of them are married and have responsibilities over their families. Compensation paid to the displaced people ranged from Z$720 to Z$725 000 (Table 2). The mean payments per household in 1999 was Z$27551.43 with a standard deviation of Z$ 5376.54 and a coefficient of variation of 23%. The mean payment made in 2002 is Z$283 448.7. Variation in compensation given to the beneficiaries explains the varied nature of the type of dwellings and developments on the affected homesteads. The table also shows that there was delay in payment of compensation to the

affected families. A brick house would fetch more money as compared to a hut. Fruit trees were also compensated basing on the estimated value of fruits each plant can produce in a season. A summary of the fruit trees affected by the construction of the dam is shown in Table 3.

Table 2: Compensation levels and the number of beneficiaries

Year	***Month***	***Number of beneficiaries***	***Total amount paid in (Z$)***	***Lowest amount (Z$)***	***Highest paid in (Z$)***	***Mean amount paid (Z$)***
1999	November	14	385 720.00	720.00	61 700.00	27 551.43
2002	May	23	6519 320.00	42 000	725 000	283 448.70
Total		37	6 905 040.00			186 662.70

Note*: Z$ is equal to Zimbabwe Dollars (2002)*

Table 3: Fruit trees affected by Mpudzi Dam (2)

Ward	***Mango***	***Mulberry***	***Paw Paw***	***Avocado***	***Naartijees***	***Bananas***	***Lemons***
Munyarari	14	12	6	1	2	30	3
Chitora	59	3	3	0	0	0	2
Total	73	15	9	1	2	30	5

Though fruit trees were compensated these take long to establish and the displaced families may spend a longer time without fruits like mangoes and bananas in their new areas (**Table3**). They may have to spend money on buying fruits, as these are a vital source of vitamins. In respect to the type of dwellings Chitora ward had the highest number of families with huts whilst Munyarari Ward had the highest number of brick houses affected by the construction of the dam. There was no evidence to show that families were assisted in building new houses. The monies paid were based on evaluation done on the existing structure. Huts were the dominant type of dwelling and this could have reduced the level of compensation given to the displaced families. There was also limited development of sanitary facilities with only 7 identified Blair toilets for the 46 families displaced (**Table 4**).

Table 4: Impact of Mpudzi Dam (2) on dwellings and arable land

Ward	*Huts*	*Brick houses*	*Toilets*	*Fields size (ha)*
Munyarari	23	8	4	9.2
Chitora	26	7	3	9.2
Total	**49**	**15**	**7**	**18.4**

Impact of Mpudzi Dam (2) on cultural sites and grave sites

The name Mpudzi River has a unique history and is believed to have originated from the abundant pumpkins naturally occurring along the river in the past. The current site of the dam was known locally as “Boto”, a natural pool that occurred on this stretch of the river. Elders used to respect this natural pool and beer was brewed to appease the ancestors on an annual basis. The pool is believed to have disappeared due to the 1978 floods that occurred in the area. Currently these rituals are no longer performed due to the lack of unit among the local leadership.

The construction of the dam affected locally important cultural sites and gravesites. Twenty-two graves were relocated to the surrounding areas with the assistance of the local leaders and the Government. Most of the graves, 13 (59%) were from Chitora Ward and the remainder 9 (41%) were from Munyarari Ward. These were found on the dam impoundment area. Each extended family had a graveyard and there was no indication of a common community graveyard. The displacement of these gravesites also meant the removal of tree species usually conserved around gravesites.

Village heads indicated that the Mushuma Tree (*diospyros mesipiliformis*) under which they performed their rituals was also affected by the construction of the dam and the rising water has since covered this. The original cultural site was 100 metres from the dam wall on the impoundment area. According to interviews with the local leadership rituals were performed so that the cultural site could be relocated to other Mushuma Tree 20 metres downstream of the dam. Another culturally important site affected by the construction of the dam was the Chinyarudzinga Hill. In this hill the locals perform their ‘rain making ‘ceremonies. This hill lies on the right-bank of the dam site and part of it was cleared for campsites and the waterbaillif’s house. During the time of construction the annual ceremonies were suspended in this area and they were expected to resume once construction was completed.

Chinyarushoko Ridge to the east on the left bank is used also for 'rain making' rituals. Local leaders put some traditional brew that is believed to control the patterns of rain bearing winds. Winds in this area generally blow from the South East and Chinyarudzinga Hill is part of the barrier to these winds. The local believe the noise and dust produced during the construction period had the capacity to anger the spirits of the mountains. However, another section of the community believes the construction of the dam would improve the availability of water and would appease the spirits. The location of the dam on a culturally important site was perceived to be the work of the spirits by the traditional leadership. Local leaders believe, the construction of the dam relates well with their traditional practices. However, there was a feeling that inundation of part of the channel will prohibit them to access other sites where they used to perform their rituals. Five such sites were identified during the field trip. These are located 3 km from the dam site within the river channel. These areas are already covered by water and it will be difficult for the local leaders to perform their rituals in these areas. The length of stay in the area has direct impact on the values the locals attach to their cultural sites. It has been shown that belief systems have an effect on resource utilization. Rivers are believed to be God created and sources of water, fish and other resources that are vital for the survival of the local communities. The construction of the dam though having direct impact on cultural sites it is viewed that its siting on a locally important cultural site has to do with the intervention of the spirits of the river.

The construction of the dam also brought with it leadership disputes or in cases ignited old scores as leaders fought to be in control of most of the activities related to the construction of the dam. Though compensation was paid to some of the village heads they refused to move away from the area, as this would separate them with their cultural sites and people. They fear also to lose control if they are relocated to other villages. Leadership disputes are related to the importance the leaders attach to their cultural sites and beliefs as a form of identity and belonging. The risk of losing identity often presents leaders with a challenge to relocate and discover other subjects or lose leadership altogether. In our African tradition belief the chief remains a chief and may not be disposed of his authority and be part of the village members. The chief can only be dethroned by death. For most of the village heads they derive their authority from the chief and are responsible for specific geographic locations out of which they lose authority

Types of jobs and earnings

Prior to the construction of the dam the locals had various sources of income as established through field observations. These are crop farming, rearing of animals, remittances from relatives in towns, selling of wares at the local business centres and formal employment. Incomes can be

described as low and the construction of Mpudzi Dam (2) brought relief to the local community as most people expected employment from construction companies.

Table - shows the types of jobs offered to the local people. The data were confirmed through interviews with key informants that participated in the construction of the dam including former workers as well as secondary data sources provided by ZINWA. Most of the people were employed as general labour (68%) whilst 8% were employed as security guards. The remainder indicated they were employed as builders (2.5%) whilst 8 % were technicians.

Interviews with ZINWA officials revealed that the majority of the people were employed as stone pickers over a period of 8 months in two years. The locals were organised into three groups each comprising 45 people and led by a village head. The stones were picked in areas surrounding the dam site. Each stone picker had a daily target of 30 wheelbarrows. The mean monthly income for the stone pickers was Z$ 4000 as shown in **Table 5**. Builders and security guards were paid an average monthly salary of Z$9000 whilst technicians averaged Z$15 000. Technicians according to employment records assisted in testing soils in laboratories and had a minimum of secondary education. The mean income for the entire sample of jobs shown was Z$ 8200 with a standard deviation of Z$45 and a coefficient of variation of 0.6%. This shows that there were insignificant differences between the remunerations given to the local workers.

Table 5: Types of jobs, number employed and the mean monthly incomes

Type of job	***Number employed***	***Mean Monthly income (Z$)***
Builders	5 (2.5%)	9000
Technicians	8 (4.0%)	15 000
Stone pickers	135 (68.0%)	4000
Security guards	16 (8.0%)	9000
Others	36 (18.0%)	4000
Total	200 (100.0)	8200

Note: The value of the Zimbabwe Dollar has been falling rapid in recent years; figures stated in this report represent the value of the dollar in 2002.

The results seem to confirm the notion that dam construction activities provide lowly paid jobs to the locals. This can be attributed to the fact that contract companies retain trained staff and may only recruit general labour from the local community. In terms of participation of the local community in the construction of the dam the results show involvement of a wide section of

people including headmen. Those employed here were also recruited from the various wards of Zimunya a fact that could have increased awareness on the importance of the dam to the rural communities.

Conclusions and Policy Implications

The paper has discussed the social costs and benefits of the construction of Mpudzi Dam (2). The dam has brought with it some benefits like the creation of a reliable source of water for the local community. Jobs created were mainly temporary and for the community to continue to benefit from the dam in this way there is need to establish irrigation schemes in the shortest possible time. Tourism can be developed in the area if the department of Parks and Wildlife moves in to assist ZINWA in creating a buffer zone around the dam. This may result in the displacement of other families thereby marginalizing them. The creation of a reliable source of water may also increase the incidence of water borne and water related diseases. This implies that a comprehensive dam management plan must be put in place in order to enhance the development potential brought by the dam.

On the balance there are more environmental and social costs than benefits. Short-term costs included the creation of a market for stolen goods, which has contributed to the increase in family and leadership disputes. These disputes were also related to the increase in unwanted pregnancies and resistance to move to new areas that are mostly along the Eastern Highlands and are poorly connected and remote. The costs are permanent and irreversible like the loss of arable land to the flooding waters. This has a potential to increase pressure on land in areas where most families are found on steep slopes and along river valleys. Of particular concern were the cumulative impacts of the construction of the dam on indigenous plants that were a source of medicines and wood resources for the local community. People may be forced to compete for the few plants that remain thereby degrading the environment in a more significant manner. This may result in accelerated bio diversity loss of both living species and their habitats.

A total of 46 households were displaced by the construction of the dam. Whilst there was compensation arranged for loses incurred in real terms this did not cover the social cost and stress that one undergoes in starting a new home and let alone to mobilize material for construction. Once the level of compensation was determined there was no evidence of adjustments to relate to the prevailing inflation rate for those whose compensations were delayed. Such considerations could only have been possible if a detailed environmental impact

assessment was done prior to the construction of the dam. Compensation was delayed and there was no assistance given to the displaced families to move their goods. Furthermore, compensation was given for the infrastructure on the land and fruit trees. On the balance the resettled farmers were given larger pieces (5ha) of land in the new areas than the average 2 hectares they had in their original home areas. Some opted to stay fearing to lose their properties, relatives and, cultural sites and gravesites. The communal lands act does not give peasants title to land so they are incapacitated in stopping the will of the state when they start rural development projects since all land is state land. There is no recognition of the communal common property arrangements and the role of local traditional leaders in determining their destiny as well as having the right to choose what they need for their people.

The dam has also impacted negatively on the gravesites and cultural sites. Twenty-two graves were relocated prior to the construction of the dam to areas surrounding the dam. The dam also affected local cultural sites and some rituals had to be performed before the construction of the dam.

The construction of the dam was done in accordance with the specifications of the Water Act (1998) that stipulates the guidelines for the construction of dams. Safety issues were taken into consideration during planning and construction of the dam. However, the dam was constructed without an EIA study and by the time of this study there was no evidence that the planned irrigation infrastructure would be subjected to these studies. The EIA policy specifically stipulates that the construction of dams is a prescribed activity and EIA must be an integral part of the dam project cycle. Only a prospectus for the dam was produced in 1999 after the initial feasibility studies had been completed. The Department of Natural Resources (Environmental Management Agency) advised the project proponents to contact a full EIA study but the dam has since been completed without one. This is a typical case of non-compliance with existing policies and regulations as well as the disregard of the precautionary principle of natural resources management enshrined in the Environmental Management Act (2002).

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