

Unpacking Negative Externalities of Social Capital in the Sustainability of Smallholder Rural Irrigation Farming: The Case of Rozva Irrigation Scheme in Bikita District, Zimbabwe



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ABSTRACT: The article examines the negative externalities of social capital in the sustainability of smallholder irrigation farming. Smallholder irrigation farming has become one of the main sources of rural livelihood in Zimbabwe given the deficiencies in rainfall triggered by climate change among other factors. The establishment of smallholder irrigation schemes, refurbishment of irrigation infrastructure, introduction of new technology and the subsidization of farm inputs are several initiatives taken by the government of Zimbabwe, Non-Governmental organisations and the private sector to improving agricultural productivity among smallholder irrigation schemes. Despite these efforts, smallholder irrigation farming has remained unsustainable. Resultantly, most rural communities in Zimbabwe continue to face hunger and poverty, two overarching sustainable development goals (SDGs 1 & 2) one and two. This study examined the negative externalities of social capital on efforts to improve productivity and sustainability of Rozva smallholder irrigation scheme. The article argues that linking social capital, which includes partnerships between Rozva irrigation farmers and donor agencies, has created dependency syndrome that is inimical to the sustainability of the irrigation scheme. The article concludes some social connections detrimental to the sustainability of the scheme tend to create divisions among farmers. The article argues there is need for awareness on negative externalities of social capital and reduce these effects on the sustainability of the smallholder irrigation to realise social capital benefits among irrigation farming communities in Zimbabwe.

KEYWORDS: Social-capital, smallholder irrigation, SDGs, Conflict, sustainability,

I. INTRODUCTION

Irrigation farming is a powerful mechanism for achieving sustainable livelihoods and alleviating poverty through income generation, improvement in agriculture and providing opportunities for livelihoods diversification (Mhembwe, Chiunya, & Dube, 2019; Moyo, Van Rooyen, Moyo, Chivenge & Bjornlund, 2017; Tapela, 2008; Smith, 2007). Furthermore, Moyo et al. (2017) reflect that in semi-arid regions, rainfall is erratic and unreliable for dry farming, hence irrigation schemes become very critical for the success of agriculture, with approximately 80% of agricultural land in Zimbabwe lying in arid and semi-arid regions (Mhembwe et al., 2019; Moyo et al., 2017). The adoption of irrigation schemes is an essential policy to eradicate poverty and improve food security through harnessing one of the five and sometimes six pentagon capital assets, natural, human, financial, physical, and social capital assets across rural Africa (Mhembwe et al., 2019). Such policy option greatly impacts livelihoods among rural communities where agriculture is their bedrock (Mhembwe et al., 2019; Gebrehiwot, Mesfin & Nyseen 2015). The need for sustainable livelihoods and increased food security in developing countries has necessitated the establishment of irrigation schemes given the need to increase crop water supply (Food and Aid Organization and World Water Council, 2015). Furthermore, Mapuranga & Muzerengi (2017) infer that small-scale irrigation schemes in many less developed countries, particularly in Africa, were initiated mainly to boost agricultural production to reduce farmers' dependency on unpredictable rainfall that characterises African climatic conditions (Mapuranga & Muzerengi, 2017).

However, irrigation farming runs the risk of fragility and might break down when exposed to external shocks (Cardenas *et al.* 2017). These shocks include climate change, changes in the natural environment and the socio-ecological systems (SES), and economic changes (Villamayor-Tomas, 2017). In Zimbabwe, small-scale irrigation systems are critical common property resources (CPR) needed to increase crop water supply in the fields to sustain livelihoods, particularly in semi-arid regions

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(Mhembwe et al., 2019; Mapuranga & Muzerengi, 2017; Gebrehiwot et al., 2015). Scholars highlight the importance of social capital in irrigation farming drawing from cases around the world. However, if poorly managed, social capital can have deleterious negative externalities in the sustainability of smallholder irrigation schemes. This article analyses negative effects of social capital on the productivity and sustainability of the Rozva smallholder irrigation scheme in Bikita in Zimbabwe.

II. LITERATURE REVIEW

1) Perspectives on Social Capital Definition

There has been little consensus among scholars on the definition of social capital. The concept has therefore, been viewed from different perspectives which also vary from one field of study to another. This article explores the different meanings of social capital from the network perspective (Claridge, 2004; Anheir and Kendall, 2002; Adler and Kwon, 2002), social structural perspective (Lin, 2008), minimalistic perspective (Ostrom and Ahn, 2001, Burt 1992) transitional perspective (Scoones, 1998; Bourdieu and Wacquant, 1992) and cognitive (Nahapiet and Goshal, 1988) perspective. These perspectives shed more light on the different forms of social capital and their usefulness to the productivity and sustainability of small holder irrigation farming in rural communities. The notion is to view small holder irrigation farming as an effective livelihood strategy that could promote food security in rural areas.

2) Network Perspective

Social capital, from a network perspective comprises categories such as bonding, bridging, and linking social capital (Claridge, 2004). Bonding social capital refers to the relationships amongst members of a network who are similar in some form (Putman, 2000). Similarly, Anheir and Kendall (2002) argue that bonding social capital closely relates to thick trust that is people in this category usually have much trust with one another. Kirori (2015, p.25) also note that bonding social capital involves ties that exist in dense or closed networks within homogeneous groups such as neighbourhood, family and friendship. This form of social capital helps people to “get by” in life on a daily basis (Kirori, 2015). However, bonding social capital can result in exclusion of other members in a community and thus this exclusion can deprive the community from benefiting from innovative thinking from those outside the social network.

According to Wendy and Hughes (2002) bridging form of social capital functions as social lubricant and has a potential to work as social leverage to help one get ahead. The above view is magnified by (Adler and Kwon, 2002) who argue that bridging social capital enhances the member’s ability to gather information, gain access to power or better placement within the network or ability to recognise new opportunities. Thus, bridging social capital is viewed as the relationships that exist amongst people who are similar in a demonstrable fashion such as socio-economic status, age, ethnicity, race and education (Szreter and Woolcock, 2004). The relationship created in this form of social capital are voluntary, continuously leaving open the option of breaking up or changing one relation for other without strong social sanctions (Irene and Knorringa, 2007).

Healy and Cote (2001) view social capital as the relations between individuals and groups in different social strata in a hierarchy where different groups access wealth, power, and status. It also includes relationships with institutions and individuals with relative power to provide services, resources or jobs (Woolcock, 2001). Narratives by Healy and Cote (2001); and Woolcock (2001), later magnified by Claridge (2004) who argued linking social capital develops over time and involve shared cultural values regarding service provision and long term trusting relationships. Claridge (2004) further highlights that linking social capital involves reciprocity in that the funders expect effective use of grants and mentors expect people’s work to reflect well by performing well in their lives or assisting others. For example, the Food and Agriculture Organization provides a range of services to irrigation schemes in Zimbabwe and other countries that include rehabilitation of irrigation equipment, training, and provision of new technology in irrigation scheme (FAO, 2000).

3) Social Structure Perspective

From a social structure perspective, social capital is not a single entity but rather different entities with two elements in common which are: they all consist of social structures and they facilitate certain actions of actors within the structure (Coleman, 1988, p. 98). Forms of social capital, according to the structural perspective, include established roles and social networks supplemented by rules, procedures and precedents (Claridge, 2004). The Social Structure Perspective of social capital focuses on networks characteristics and the position of individuals within networks to understand both the functioning and efficiency of the entire network and the range of benefits potentially available to individuals (Lin, 2008). Structural social capital also focuses on established roles and social networks supplemented by rules, procedures and precedents (Claridge, 2018) and these elements of social structure help to create opportunities for the social realisation of productive ends.

4) Minimalistic Perspective

Coleman (1988) viewed social capital as a set of resources that are inherent in family relations and in community organisations that maximise cognitive or social development for individual. Hence, from the minimalistic perspective social capital is viewed as one’s relationships with friends, colleagues and more general connections, which maximises the financial and human capital one

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already possesses (Burt, 1992 p. 9). The minimalist perspective therefore views social capital from an individual point of view and is understood to enable individuals to have access to favourable networks (Ostrom and Ahn, 2001). Fukuyama (2001) also viewed social capital as instantiated informal norms that promote cooperation between two or more individuals. The forms of social capital from this perspective include trust and trustworthiness, norms and sanctions, obligations and expectations and identity and identification (Claridge, 2004).

5) Transitional Perspective

Bourdieu and Wacquant (1992 p.119) view of social capital is a public good resource or as the sum of resources, actual or virtual that accrues to an individual or a group by virtue of possessing a durable network or institutionalised relationships of mutual acquaintance and recognition. Scoones (1998) also viewed social capital as the social resources (networks, social claims, social relations, affiliations, associations) upon which people draw when pursuing different livelihood strategies requiring coordinated action. This perspective relates to the public good nature of social capital (Ostrom and Ahn, 2001). Social capital therefore does not only make actors achieve their individual goals but also their collective goals by utilising forms of social capital such as effective sanctions, norms, social relations and appropriable social organisations (Ostrom and Ahn, 2001).

6) Cognitive Perspective

The cognitive perspective of social capital is linked to Bourdieu's theory of habitus that is the set of dispositions, reflexes and forms of behaviour people acquire through acting and being part of a society (Bourdieu, 1986). According to Nahapiet and Goshal (1988) cognitive social capital refers to resources providing shared representation, interpretations and systems of meaning among parties. Thus, the cognitive perspective of social capital relates to the social setting or culture that dictates how people should act in a particular situation (Claridge, 2004). The author adds that the examples of forms of social capital under the cognitive dimension include shared language codes and narratives, shared values, attitudes and beliefs. Similarly, Paul (2007) also echoed the above view by arguing that cognitive social capital is the shared language and codes among parties that provide the foundation for communication.

III. DETERMINANTS OF SUSTAINABILITY OF SMALL HOLDER IRRIGATION SCHEMES

In a study carried out in Ethiopia in relation to sustainability of smallholder irrigation scheme, Wichelns *et al.* (2012) identifies five determinants of sustainability of irrigation schemes that include farm profitability, land and water resources management, technical capacity, financial management, and governance. While pursuit of irrigation policies and programmes ought to ensure that expansion in food production does not compromise the biological sustainability of agricultural lands (Commission 2009), responsive policies and programmes, especially in Sub-Saharan Africa, have been low (Agula, Akudugu, Mabe & Dittoh, 2018; Abdul-Hanan, Ayamga, Donkoh., 2014). Most farmers in the sub-region still employ farm-based practices that are environmentally unsustainable, which put the health of the agro-ecosystems in danger (Agula *et al.*, 2018). Narratives below discuss these determinants:

1. Water Resources Management

The sustainability of irrigation schemes is measured based on its capacity to effectively manage water resources, that is, ensuring the adequacy of water in an irrigation scheme is a measure of the ability of water supply schedule to meet the water demand for optimal plant growth (Hetcher *et al.* 1999 p.59). Cai *et al.* (2001) who noted that sustainable irrigation water management should simultaneously achieve two objectives that reinforce the above view: sustaining irrigated agriculture for food security and preserving the associated natural environment. Perry *et al.* (2009), emphasize the importance of differentiating between beneficial and non-beneficial consumptive and non-consumptive uses of water. FAO (2012) also differentiates between improving: (a) water-use efficiency, which aims at minimizing water losses by improving technical efficiency; and (b) water productivity and profitability, including increased yield through improvements in water, land and agronomic management practices, reduced evapotranspiration, growing higher-value crops or engaging in value-adding processes. This dimension of sustainability therefore relates to water adequacy and effective management of water resources to ensure continuity in the supply. Focus here would be on effective irrigation water laws which provide effective provisions of conflict-solving mechanisms, irrigation water policy (payment of irrigation water, private sector participation, linkage with other economic policy), management of irrigation water (effectiveness of farmers association in canals, irrigation management committees, suppliers and markets) and updates and maintenance of data (Chazovachii, 2016).

2. Governance

Tafesse (2003) posits that governance captures organisational strategy, organisational management, linkages, legal and political frameworks, external cultural frameworks and participation and legitimacy. In Africa, this process of 'irrigation governance transfer' has been an ongoing part of reform in government-run, farmer-association managed irrigation systems, since the mid-1980s (Bjornlund *et al.*, 2016). In most cases, it has been a transfer of management rather than ownership, with government

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withdrawal from fee collection, conflict resolution, and operation and maintenance (Shah *et al.* 2002). Beyond that, Bjornlund *et al.* (2016) note that small-scale irrigation schemes face challenges around conflict resolution, particularly in resource use between public and private irrigation and upstream and downstream users. Unclear mandates are known to hamper conflict resolution initiatives (de Fraiture & Giordano, 2014) or the reluctance of members to deal with issues where they have conflicts of interest, bring governance to then fore. With regard to governance, sustainability is measured based on whether members managing the schemes are aware of the mission and vision, existence of realistic objectives which are in line with state obligations, clear to all staff and flexible and competency of irrigation management committees in making rational decisions (Chazovachii, 2016).

3. Technical Capacity

According to FAO (1999), the maintenance of infrastructure system is crucial in guaranteeing the sustainability of irrigated agriculture. Mwendera *et al.* (2013) also highlight that resource evaluation and proper technical maintenance are a backbone to the success of smallholder irrigation schemes. Technical capacity relates infrastructure system (technical and administrative equipment)'s capacity to sustain the irrigation schemes (Chazovachii, 2016). Infrastructure barriers for small-scale irrigation schemes include dilapidated water supply systems, poor construction quality, and lack of resources to maintain infrastructure (de Fraiture, Kouali, Sally, & Kabre, 2014). Sustainability of an irrigation scheme is therefore its ability to use, repair infrastructure and rehabilitate equipment required for the proper functioning of a smallholder irrigation scheme (Koc, 2017). Investment in small-scale equipment, such as power tillers, can bring income returns, but lack of affordability and availability present difficulties for irrigators (Giordano & de Fraiture, 2014).

IV. NEGATIVE IMPACTS OF SOCIAL CAPITAL ON THE PRODUCTIVITY AND SUSTAINABILITY SMALL HOLDER IRRIGATION SCHEME: CREATION OF PATRON-CLIENTELISM

NGO and local communities' relationship resembles patron-clientelism, which can have detrimental effects to the sustainability of community livelihoods programmes (O'Reilly, 2010). These relationships tend to create dependency on donors and NGOs, which leads to failure of projects if aid is withdrawn. Linking social capital, which relates to relationships between the community and institutions can also result in the creation of patron-clientelism when there is lack of proper accountability measures (Claridge, 2018). For example, the in Sauri, Kenya the 'free gift' approach adopted by NGOs as a strategy to get farmers to adopt new technologies under Millennium Village Project ignited a 'dependency syndrome' among the farmers who thought that they would continue getting free inputs (Hebinck and Kimanthi, 2018). After the withdrawal of the 'free gifts', most poor farmers could not continue to engage with the MVP desired development strategy therefore resulting in the failure to produce the food without the free agricultural inputs and sustain the irrigation project (Hebinck and Kimanthi, 2018). Social capital in form of connections with NGOs and other organization can therefore be detrimental to innovativeness and creativity in smallholder irrigation schemes

V. RESTRICTION OF INDIVIDUAL FREEDOM AND INNOVATIVENESS

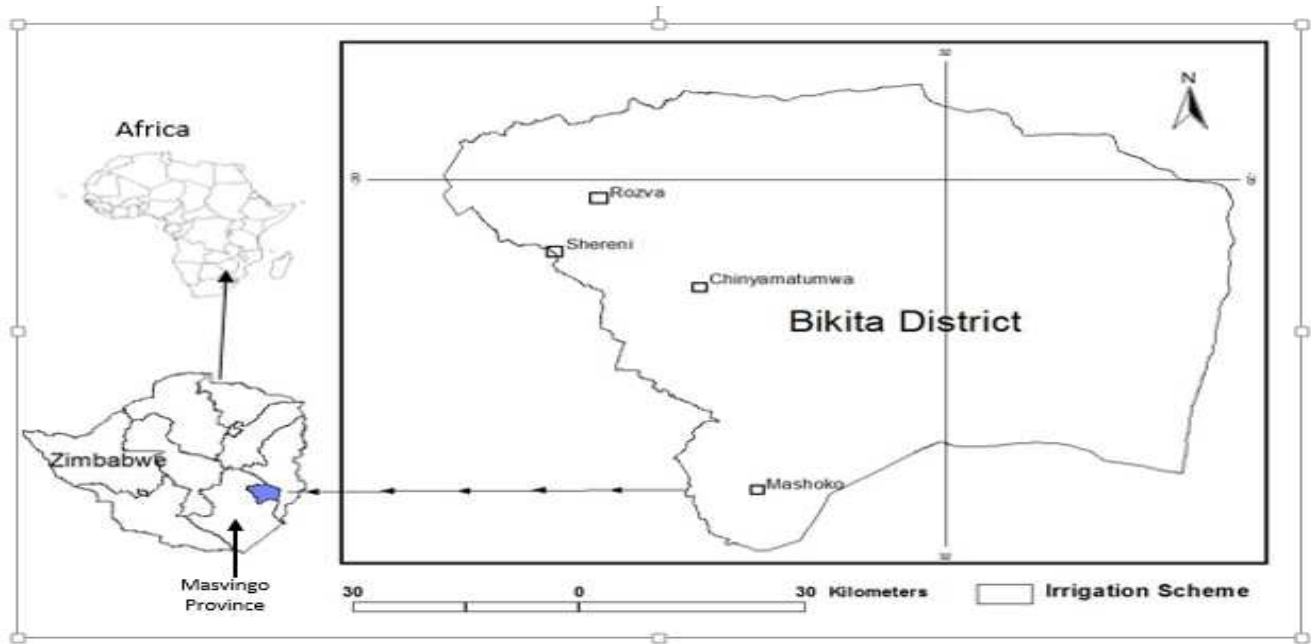
Portes (1998) highlights that multiple networks result in intense demand for adherence to social norms, which reduces privacy and autonomy. The restrictive behaviour can be seen in closed networks who can isolate themselves (Adler and Kwon, 2002) resulting in loss of incentives to acquire new information and sometimes retaining negative information (Beugelsdijk and Smulders, 2003). For instance, Adrianzen (2009) illustrates that bad performance of some technology adopted by some farmers resulted in complete rejection of new technology in the whole community. Hence, Westlund *et al.* (2013) also argue that social capital can counteract innovativeness and creativity because of rigid networks and values, which supports the status quo. It is important to note that social capital can also restrict individual freedom and innovativeness due to the demand for conformity with norms and values (Venkatesh, 2017). Furthermore, closed networks and ties among community members can for instance, restricts innovativeness and individual freedom which can negatively affect irrigation technology adoption (Hunecke *et al.* 2017).

VI. STUDY AREA

The study was conducted at Rozva small-scale irrigation scheme in ward 13 of Bikita district in Masvingo Province, Zimbabwe. The district is 80 km from Masvingo Central Business District (CBD). Bikita falls under Natural Region (iv) of the country's climatic regions. Bikita falls in a medium drought-risk zone (Chikobvu, 2010). The region is characterized by less than 650mm of rainfall annually, which is unevenly distributed (Seed co Zimbabwe, 2019). This makes supplementary farming in form of irrigation schemes a necessity. The location of Bikita district and Masvingo province in the map of Zimbabwe is presented below.

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VII. FIGURE 1: MAP OF BIKITA DISTRICT



Source: Google Maps (2019)

VIII. METHODOLOGY

The study was informed by the constructivism research paradigm which assumes that; all knowledge and therefore all meaningful reality as such is contingent upon human practices being constructed in and out of interaction between human beings and their world, and developed and transmitted within an essentially social context (Crotty (1998, p.42). The article used qualitative research approach and a case study research design to carry out an in-depth analysis of the operation of Rozva Irrigation scheme as a case. The target population consisted of the 117 people and using the raosoft calculator a sample size of 91 people was selected for the analysis. The sample size was divided into quotas according to the blocks and committees in the irrigation scheme and subsequently, the quota sampling technique was used to select the respondents. Data was collected through focus group discussions, semi-structured questionnaires, semi-structured interviews and document analysis. Thematic analysis was used to analyse field data. The next section discusses the results of the study.

IX. RESULTS AND DISCUSSION

- 1) Demographic Analysis
- 2) Response Rate

The response rate of respondents that participated in the study is presented in Table 1 below.

3) Table 1: Response Rate

Category	Targeted Respondents	Actual Respondents	Response Rate %
Overall study	91	89	97
Questionnaire	69	68	98.5
Focus group discussions	12	12	100
Interviews	10	9	90

Source: Field data (2019)

Results from Table 1 above show that a total number of eighty-nine respondents participated in the study. Sixty-eight (97%) participated in the questionnaire, twelve (100 %) in the focus group discussions and nine in the interviews. The sample size was ninety-one. As a result, the overall response rate for the study was 97%. Sixty-nine questionnaires were distributed and sixty-eight were retained resulting in 98.5% response rate in the questionnaire method. Two Focus Group Discussions with six respondents in each were planned and conducted, translating to 100% response rate in FGDs. Ten interview respondents were targeted and nine participants were accessed resulting in 90% response rate in the interviews. The above analysis indicates that there was a high response rate in the study. The high response rate is essential in the enhancement of accuracy and quality of study results (Babbie, 1990). High response rate also enhanced the reliability and validity as well as representativeness of the results (Fincham, 2008).

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Thus, the high response rate implies that the Rozva irrigation scheme farmers were willing to provide information concerning their irrigation activities as part of the basket of livelihood portfolio to outsiders.

X. NEGATIVE IMPACTS OF SOCIAL CAPITAL ON THE SUSTAINABILITY OF ROZVA IRRIGATION SCHEME

Social capital has the potential to negatively affect the productivity and sustainability of the Rozva irrigation scheme in a number of ways as highlighted by respondents below. The results are discussed below according to different themes.

1) Creation of Dependency Syndrome

Dependency syndrome has been viewed as a challenge in the sustainability of the smallholder irrigation schemes in rural areas of Africa, Asia, and Latin America. The influence of negative social capital has exacerbated the dependence on development partners such that the performance of smallholder irrigation schemes has been compromised as presented in Table 2 below.

2) **Table 2: Social capital and creation of dependency syndrome**

Variable	Percentage of Responses
Partnerships with NGOs and donors (linking social capital)	40
Not indicated	60
Total	100

Source: Field data (2019)

Results in Table 2 above show that 40% of the respondents indicated that partnerships and relations with institutions have created a culture of dependency among the farmers. However, 60% did not indicate their opinions in relation to partnerships and the creation of dependency syndrome among the farmers. The results imply that linking social capital derived from the partnership with NGOs and other donors have cultivated a culture of dependency on development partners for agricultural inputs and infrastructure support. This view finds expression narratives by the Agriculture Extension Officer who highlighted that;

Donations of inputs and refurbishment equipment from donors and NGOs, has made some farmers in the scheme to become too depended to the extent that they fail to purchase their own inputs and contribute towards irrigation maintenance because they assume that donors and NGOs will come to provide for them' (Interview with Agriculture Extension Officer, 10 June 2019).

Results from the Key Informant interviews indicated that if the donations are not forthcoming the farmers resort to using sub-standard seeds, some farmers end up growing crops that are not in the irrigation programme and in some instances, they leave some parts of the plots idle.

These results suggest that these factors are detrimental to crop productivity and increase in yields at the irrigation scheme, which is a threat to the sustainability of this important livelihood strategy. This view is consistent with the findings by the Association for the Development of Education in Africa (2013) that argues dependency syndrome has undermined the culture of resilience and sustainability of livelihoods among rural communities in Zimbabwe. The article suggests that although linking social capital is important in helping farmers to achieve the sustainability of the Rozva smallholder irrigation scheme, this form of social capital tends to create dependency syndrome, which is a threat to the improvement of rural livelihoods. The article argues that social capital has the potential to pose some threats to the sustainability of smallholder irrigation schemes hence, there is need to empower rural farmers to be more self-reliant than dependent on donors if food security and rural livelihoods can be enhanced through irrigation farming in Zimbabwe.

XI. CREATION OF DIVISIONS

The negative aspect of linking social capital and social connections have been found to create divisions among members as presented in Table 3 below.

Table 3: Social capital and creation of divisions

Variable	Percentage of responses
Social Connections	80
Not Indicated	20
Total	100

Source: Field data (2019)

Results in Table 3 above show that 80% of the respondents indicated that social connections were responsible for the divisions in the irrigation scheme. However, 20% did not indicate their views concerning social capital and the creation of divisions in the irrigation scheme. The notion of division in the smallholder irrigation scheme was magnified by the results from interviews with the Irrigation Management Committee members who noted that the farmers in the irrigation scheme tend to identify themselves

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with their respective chiefdoms namely the Marozva and Mukanganwa. The respondents indicated that the two chiefdoms wanted the irrigation scheme to be divided into two according to their wards and chiefs. The division identified by respondents is detrimental to progress and furthermore, the management committee indicated that it was working tirelessly to settle the issue. For instance one interview respondent highlighted that; '*divisions have affected collective action initiatives, fund raising programmes and meeting attendance in the irrigation scheme*' (Interview with an Irrigation Farmer, 11 June 2019).

The article suggests that the division among irrigation farmers is not health for the collective and cooperative efforts needed for the success of the irrigation scheme crop farming programme. The narratives above are consistent with the finding by Chazovachii (2016) who highlighted that chieftainship wrangles in smallholder irrigation scheme results in institutional weaknesses and limited collective action towards the maintenance of irrigation infrastructure, which threatens their viability and sustainability. Thus, the article argues that despite being a positive resource, social connections has the potential to be detrimental to sustainability and survival of smallholder irrigation scheme especially if social connections are used to creation of divisions among irrigation farmers.

1. Difficulties in reaching consensus

The negative aspect of the cognitive perspective of social capital has been found to create difficulties in reaching consensus among members as presented in Table 4 below.

2. Table 4: Social capital and consensus in decision-making

Variable	Percentage of responses
Differences in religious beliefs	60
Not indicated	40
Total	100

Source: Field data (2019)

Table 4 indicates that 60 % of the respondents identified differences in religious beliefs as the factor that created challenges for the farmers to achieve unanimous decisions in the general management of the irrigation scheme. However, 40% did not indicate their views concerning social capital and consensus in decision making in the irrigation scheme. Similarly, results from focus group discussions also indicated that differences in religion beliefs among farmers resulted in difficulties in reaching consensus concerning closing days (days when it a taboo to work on the plots) of the irrigation scheme. Respondents noted that some farmers were Seventh Day Adventists and rested on Saturdays, others were from Pentecostal and main-line churches and attended on a Sunday hence, they wanted the irrigation scheme to be closed on Sundays and others wanted the irrigation scheme to be closed on Wednesday as it was a *chisi/inzilo* which means a traditional day of resting. The article argues that the issue of agreeing on the a traditional day of resting (*chisi/inzilo*) was detrimental to the sustainability of the irrigation scheme as there was need to develop proper opening and closing schedule at the irrigation scheme which is essential in the maintenance of order. Hence, cognitive perspective of social capital has negative externalities that can threaten the sustainability of smallholder irrigation farming and thereby threatening food security and enhancement of rural livelihood.

XI. CONCLUSION AND POLICY RECOMMENDATION

The article concludes linking form of social capital tends to create a dependency syndrome among the Rozva irrigation farmers. The article argues that dependency on agricultural inputs and infrastructure support from development partners has created a group of disempowered farmers who are not capable of relying on their own resources to expand their crop farming business through the smallholder irrigation scheme. The article also recommends that development partners working with the irrigation farmers need to eliminate the 'free gift approach' but empower farmers through training on resource mobilisation strategies and collective mobilisation of development finance for funding their own crop farming business so as to reduce dependency syndrome on development partners.

The article argues that social connections in Rozva smallholder irrigation scheme created divisions among the farmers who aligned themselves according to their respective chiefdoms. The article concludes that the division among irrigation farmers is not health for the schemes as it hindered effective collective and cooperative efforts needed for the success of the irrigation scheme crop farming programme. The alignment of community informal norms and the traditional local governance structures with the irrigation scheme constitution is likely to ensure that there is coherence and coordination among farmers, and also between farmers and their social environment.

XII. CONFLICT OF INTEREST

The research was done for academic purposes and not for any organizational or personal gain. The authors declare that there is no conflict of interest regarding the publication of the article on the negative externalities of social capital in the sustainability of smallholder rural irrigation farming using Rozva Irrigation scheme as a case study.

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