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Mobilizing farmers to stop land degradation: A different discourse from Burundi

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Abstract

Stopping land degradation is one of the biggest challenges worldwide and particularly in Burundi, with its unprecedented rates of soil loss and growing food insecurity. This article proposes a different discourse on *how* to engage people in stopping land degradation, and presents results and lessons learned from a bottom-up inclusive approach implemented since 2014 in Burundi: the integrated farm planning (PIP) approach. The PIP approach aims to build a solid foundation for sustainable change toward enhanced food production and good land stewardship, based on three foundation principles (motivation, stewardship, and resilience) and three guiding principles (empowerment, integration, and collaboration). This article is based on two studies undertaken in 2018: an impact study among 202 households and a qualitative study using the most significant change methodology with 30 households. Findings from both studies provide initial support that the PIP approach generates considerable changes at household, farm, and village level. Based on a vision and a plan for their farm, motivated PIP households are currently investing in the resilience of their farms and applying a diversity of conservation practices, while in all PIP villages concrete collective action is undertaken for sustainable land stewardship. Given its rapid upscaling in Burundi and the potential of the PIP approach to mobilize farmers for motivated action, the article concludes with a reflection on the core elements of a different discourse to stop land degradation.

KEYWORDS

Burundi, integrated farm planning, land degradation, land stewardship, mobilizing farmers

1 | INTRODUCTION

With globally 33% of soils considered degraded (UNCCD, 2017), stopping land degradation while sustainably producing food is one of the biggest challenges worldwide (Bouma & McBratney, 2013; Diamond, 2005; Webb et al., 2017). This challenge is particularly pressing in a country like Burundi, which depends on subsistence farming on often steep slopes, and where the population will double toward 2040. Already at present, with a population density of 450 km^{-2}, high pressure on the land combined with unsustainable agricultural practices is leading to wide-scale deforestation, overexploitation of the land, and soil erosion (Eggers, 2006). Burundi scores second lowest worldwide on the Global Food Security Index, with more than 50% of the population being chronically food insecure (Global Food Security Index, 2019; WFP, 2019) and unable to meet their dietary needs (Niragira et al., 2015). Although soil erosion and its

effect on crop yields are not new phenomena in this region (Dregne, 1990), current rates and scale of erosion are unprecedented, and urgent action is required to prevent the permanent loss of ecosystem services due to land degradation (Blake et al., 2018).

The question is: what strategies can reverse land degradation and declining food security? Burundi has received considerable international development aid in the past decades, but hardly any progress was made in alleviating poverty and food insecurity. The underlying reason is that these interventions were often short-term, top-down, and focused on conflict-resolution or emergency aid (Uvin, 2010). Currently, development programs start paying more attention to agricultural production and land degradation, but approaches often lack essential elements of sustainability, such as building local ownership, capacities, and motivation. Tackling complex societal issues such as land degradation cannot be done by top-down interventions or incentive-based approaches (Hall-Blanco, 2016); because "...only the self-reliant efforts of poor people and poor societies themselves can end poverty..." (Easterly, 2006).

Hence, development actors should become facilitators of bottom-up and community-based development (Abrams et al., 2009), and enable farmers to tackle land degradation themselves. This article presents such a bottom-up approach, the integrated farm planning approach, or PIP approach (in French: "*Plan Intégré du Paysan*"), which proposes a different discourse on *how* to engage people in tackling land degradation in complex rural-oriented economies like in Burundi. After conceptualizing the PIP approach in the next sections, the article discusses results and lessons learned, and concludes by reflecting on the applicability of the PIP approach to stop land degradation and move toward resilience-based stewardship.

2 | BUILDING A FOUNDATION FOR SUSTAINABLE CHANGE

Burundi is endowed with abundant rainfall, fertile arable land, and productive marshlands. However, with a population growth of 3.3% and with 87% of the population living from small-scale agriculture, plots have continuously become more fragmented (0.3–0.5 ha per household), driving farmers to further intensify production, and deplete soil fertility to the limit. Farming is mainly rainfed, with staple crops like maize, beans, and cassava cultivated on steep slopes with unsustainable farming practices. Expansion of farmland and dependence on wood for fuel has pushed deforestation, with forests currently covering only 6.6% of the territory. Erosion rates in the highlands of Burundi can reach 100 tons ha^{-1} (Ndagijimana, Kessler, & Asseldonk, 2019), aggravated by increasingly more frequent torrential rains. The resulting loss of soil fertility and its effect on food security make better land stewardship by smallholders a top priority in Burundi.

It is in this context that the PIP approach was first introduced in Burundi in 2013, aiming to build a solid foundation for sustainable change toward enhanced food production and good land stewardship with farmers. The PIP approach considers that first investing in the people and the land they manage—before investing in anything else—is a precondition for sustainable change. The household level is therefore central to motivate farmers to invest in their land, and by facilitating farmer-to-farmer trainings and knowledge exchange, tackling land degradation at community and landscape level is one of the final goals (Kessler, van Duivenbooden, Nsabimana, & van Beek, 2016).

How the PIP approach works can best be visualized as in Figure 1. Just like a tree that needs fertile soil to grow strong, the PIP approach builds a foundation for sustainable change based on three principles: motivation, stewardship, and resilience. In the PIP approach, it is assumed that such a foundation of resilient and motivated stewards of the land and its natural resources, is essential for the sustainability of any intervention or action. This is illustrated in Figure 1 by the arrow pointing to activities such as livestock improvement, reforestation, value chain development, water projects, and microcredit schemes. All such activities are prone to face limited ownership and sustainability when elements of this foundation are not addressed (Easterly, 2006; Oino, Towett, Kirui, & Luvega, 2015).

Within the PIP approach, 'resilience-based stewardship' is a key concept, in which these three *foundation principles* come together. Based on Chapin et al. (2011), who use this concept as a framework for stewardship strategies that can increase social–ecological resilience, we define resilience-based stewardship as 'motivated stakeholders who feel responsible to be good stewards of the land and its natural resources, and invest in social–ecological resilience of their landscape'. Furthermore, the blue outer circle of Figure 1 presents the three *guiding principles* of the PIP approach: empowerment, integration, and collaboration. These principles guide the implementation of the PIP approach and encourage the implementing staff to always

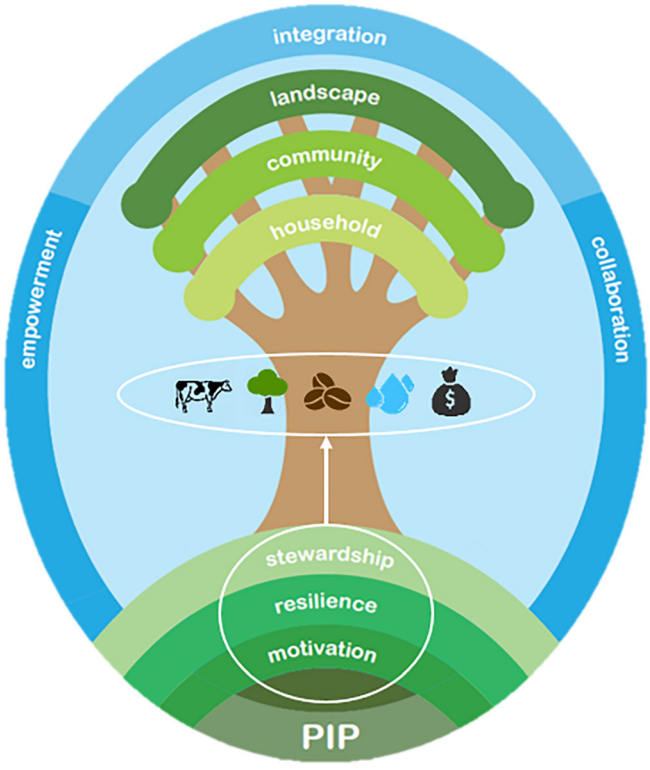

FIGURE 1 Visualization of the PIP approach [Colour figure can be viewed at wileyonlinelibrary.com]

apply all three of them in their daily work, as is further explained in Section 4. This is considered essential to stop land degradation at scale and in a sustainable way, which is illustrated by the branches of the tree where the process starts at household level, then spreads to community level and eventually covers a whole landscape.

Creating an integrated farm plan (a PIP) at household level is a key tool in the approach. This PIP creation, in which family members develop a vision and an action plan together, is a flywheel for all other changes that follow. Figure 2 gives an example of a PIP as drawn by a family, with left the current situation and right the desired future farm in 3–5 years, including erosion control measures, a diverse crop-livestock system, compost pits, a vegetable garden, and agroforestry. By creating a PIP together, awareness grows within families about the importance of integrated farm planning and limiting social and intra-household issues. These dialogues on possibilities to improve together, reach attainable goals, and how to define this in a PIP, lead to better organized households with common objectives. What follows is motivated action, because a PIP is based on households' own capabilities and knowledge, and not on project targets or objectives. These PIPs at household level are the first pieces of the required foundation for sustainable change, with further upscaling of PIP being essential to stop land degradation at village and beyond.

At village level, upscaling PIP creation takes about 2 years, with a key role for farmer innovators, who are (fe)male farmers—chosen by the community itself—with a progressive mindset and spirit to improve. They are the first to create a PIP, then become PIP trainers, and through farmer-to-farmer training—mainly in competitions between organized groups—build capacities in the rest of the community; with ever more households becoming motivated stewards of their land. This is strengthened by exchange visits and the development of village visions, which are concrete plans for diverse collective activities, better access to markets, landscape restoration, and organized village structures. Local institutions and extension workers are closely involved in all activities, given that their motivation and genuine engagement are considered essential for local ownership and the sustainability of all actions.

3 | FOUNDATION PRINCIPLES OF THE PIP APPROACH

This section conceptualizes the three foundation principles of the PIP approach—motivation, stewardship, and resilience (Figure 1)—and how they are used and stimulated in the approach to build the

FIGURE 2 Integrated farm plan (PIP) drawn by a family, with their current situation (left) and desired future farm (right) [Colour figure can be viewed at wileyonlinelibrary.com]

foundation for sustainable change. These principles are closely related and mutually reinforcing, although we assume that the main direction of causality is that motivation drives resilience and stewardship.

3.1 | Motivation

In its most basic form, motivation is an inspiration or impetus to act (Ryan & Deci, 2000). A distinction is often made between extrinsic and intrinsic motivation. Extrinsic motivation is characterized by external incentives, like rewards or avoided punishments to accomplish something (Bhaduri & Kumar, 2011; Ryan & Deci, 2000). Intrinsic motivation comes from internal sources (doing something because it is inherently satisfying or enjoyable; Ryan & Deci, 2000), and is closely related to self-determination and feeling competent to grow (Deci & Ryan, 2008). When intrinsic motivation is driven by biospheric values (i.e., care for nature and the environment), it fosters good stewardship (Ryan, Erickson, & De Young, 2003) and can be a key predictor of pro-environmental behaviour (Steg, 2016). Strengthening biospheric values thus seems to be crucial for engaging people in sustainable change (De Groot & Steg, 2010), especially when accompanied by higher degrees of autonomy (Osbaldiston & Sheldon, 2003); that is, people feeling ownership of this change.

In the PIP approach, intrinsic motivation and care for the environment are stimulated from the start, when during PIP creation families draw their future vision. Visualizing an attainable future gives people an increased sense of purpose and motivates them to actively search for solutions (Greiner & Gregg, 2011) to achieve this vision. This means that promoting ownership is a key issue throughout the PIP approach, and that in all activities it is carefully avoided that farmers undertake action because of external rewards or incentives (like money or in-kind incentives). Furthermore, throughout all activities, social capital aspects such as trust, collaboration, and reciprocity are promoted, as these have a positive effect on the motivation of people to manage natural resources collectively (Pretty, 2003).

3.2 | Stewardship

Stewardship refers to our responsibility to manage and protect the land and its natural heritage (Brown & Mitchell, 1998), and involves nourishing something for someone else: for society, nature, a god, or future generations (Worrell & Appleby, 2000). Stewardship is therefore essentially different from traditional management methods, given that the latter are more focused on efficiency and profitability, while stewardship is more acting for a benevolent purpose, as a moral duty or responsibility. It is based on the premise that collective goals and behaviours have higher utility than individualistic ones (Davis, Schoorman, & Donaldson, 1997). This is closely related to awareness about environmental values, such as prevention of pollution, protection of the environment, respect for the earth, and unity with nature (i.e., biospheric values; Steg, Perlaviciute, Van der Werff, & Lurvink, 2014).

Being fundamental for conservation efforts, the PIP approach stimulates stewardship by creating awareness about natural resources and the role of each actor, inducing a responsibility to protect and conserve land, water, and vegetation. This is done in awareness raising workshops with different stakeholders, given that stewardship and motivated actors of change are needed at all institutional levels. With farmers, stewardship is further strengthened by exchange visits and on-demand trainings on good practices related to land and farm management and the use of the commons. As such, stewardship shapes pathways toward more resilience, with a pivotal role for smallholder farming in these social–ecological systems (Chapin et al., 2011; Kofinas & Chapin, 2009).

3.3 | Resilience

Resilience is described as the ability of a system to return to its initial state after a shock or perturbation (Holling, 1973). This implies the system—in our case the farm or the village with their physical and social components—to be adaptive, with interacting subsystems that respond to external shocks or other changes (Rammel, Stagl, & Wilfing, 2007). Resilience thinking thus moves away from "traditional" assumptions such as linearity and predictability (Darnhofer, Fairweather, & Moller, 2010; Scoones et al., 2007), toward dynamics of complexity within a system. This resonates well with systems-thinking approaches where interdependencies and feedback loops are central (Richmond, 1993), and which stresses the need to focus on farmer's capacity to learn-by-doing and adapt practices to their conditions, rather than on efficiency or production of a (farming) system (Darnhofer et al., 2010).

Becoming more resilient is therefore one of the three foundation principles of the PIP approach. Given land scarcity and vulnerability to increasingly unpredictable climatic risks, in all workshops coping capacities of households are strengthened. At an early stage, during PIP creation, diversification of crops, income sources, and practices is stressed, but also the importance of including nonfarm income sources, high-quality cash crops, and livestock in the farming system. Concerning social resilience, coping strategies and adaptive capacities of families are particularly crucial, in terms of education, skills, knowledge, health, and organization (Ellis, 1998; Keck & Sakdapolrak, 2013). The PIP approach continuously works on these elements of social resilience, and deliberately builds social cohesion within families and in villages.

4 | GUIDING PRINCIPLES OF THE PIP APPROACH

The three PIP guiding principles conceptualized in this section—empowerment, integration, and collaboration (Figure 1)—aim to guide how organizations and staff work with local actors. Rather than extension agents transferring knowledge, PIP staffs are *facilitators of change*; and farmers, rather than beneficiaries of a project, are *agents of change*. In this bottom-up process, PIP staff considers farmers as

partners, not as beneficiaries or as 'target population'. These guiding principles should therefore be present in each activity, internalized by the staff as an attitude to life, and conveyed to all stakeholders whenever possible. As such, the three guiding principles create the enabling conditions to firmly root the PIP foundation principles (motivation–resilience–stewardship) and work toward sustainable change.

4.1 | Empowerment

Empowerment theory stresses the need to increase personal, interpersonal, and political power of communities, as to foster collective action to improve their environments (Lee, 2011). At the individual level, empowerment concerns a process in which people gain control over their lives, develop a sense of self-determination, and eventually believe in their capability to change their own realities (Fetterman, 2017; Gutierrez, 1990; Rappaport, 1981). Furthermore, for actors going through the empowerment process, it entails making decisions themselves rather than embracing externally raised recommendations (Friis-Hansen & Duveskog, 2012). At the collective level, empowerment means that collaborating with others enables achieving goals faster.

Empowerment in the PIP approach is related to the concept of 'conscientization' (Freire, 1972), which is the process of people becoming aware about their ability to transform reality by conscious collective action. In the PIP approach this is facilitated through visioning and a planning, combined with on-demand trainings and group dynamics, which all empower farmers to act. Empowerment as a guiding principle in the PIP approach also implies that PIP staff should always work on empowering local actors to do it themselves, and trigger their intrinsic motivation. Furthermore, by empowering local actors, the PIP approach builds an ever-growing movement of actors of change who believe in their ability to improve their life, land, and the environment.

4.2 | Integration

Integrated approaches are essential when dealing with the complexity of socio-ecological systems (Folke, 2006). In relation to rural livelihoods, integration implies that components of human and agro-ecological systems are taken into account (Horton et al., 2017). Concerning integrated natural resource management, integration refers to bridging production, environmental, and well-being goals, based on participatory processes and multi-stakeholder learning (German, Mowo, Amede, & Masuki, 2012). Integration is therefore important in all phases of a project, and several dimensions of integration need to be considered (Tengberg & Valencia, 2018), among others: integration of actors and institutions, spatial integration, and integration of environmental and development concerns. When considering the watershed or farm as a system where integrated management is required to optimize synergies and make the system more robust, integration is closely related to the earlier discussed foundation principle 'resilience'.

Integration is a guiding principle throughout the PIP approach because it is present in all phases and activities. This starts already during PIP creation, where integration and diversification of activities and practices in the household and on the farm is central. However, integration also works in the social dimension of the approach, in which people value personal diversity, build social cohesion, and integrate learning into their habits. Also the PIP staff themselves apply integrated approaches during all their work, by for example, learning from each other, stimulating farmers to make integrated plans, and actively experimenting with new activities and practices.

4.3 | Collaboration

Sustainable natural resource management requires collaboration, with sound processes of governance (Agarwal, 1997), long-term associations based on trust (Palis, 2006), as well as social conditions that enable actors to share information and learn from each other (Schneider, Fry, Ledermann, & Rist, 2009). Collaboration therefore refers to joint activities and the exchange of knowledge as part of strengthening social relations and networks. Bonding social capital (between people with similar objectives) and binding social capital (the capacity to link with others) are crucial aspects of collaboration, and beneficial for joint investments in natural resource management (Pretty, 2003).

Being fundamental to development in general and being a stimulant in tackling land degradation in particular, collaboration is stimulated in all activities of the PIP approach and at all levels: in workshops with stakeholders, in each family designing a PIP, in the farmer-to-farmer group trainings, and so on. Like the previous two guiding principles, seeking collaboration with other people and organizations should be a core attitude of the staff. Particularly important is to establish trust and to continuously exchange information, which are both reciprocal actions built on equal and mutual connections (Borg, Toikka, & Primmer, 2015). This again emphasizes the role of PIP staff as facilitators of a process in which they build a coalition of actors of change at all levels.

5 | METHODS

The PIP approach was first used in 2014 by the SCAD[1] project in three provinces of Burundi: Gitega, Muyinga, and Makamba. Since 2016, the PAPAB[2] project has implemented the approach in another six provinces, covering currently (early 2020) 266 villages and nearly 80,000 PIP households. Considerable changes are noticeable in these villages, not only on the farms and concerning land stewardship, but also within the PIP households and at village level, with more social cohesion and intensified collaboration. To better understand these changes and farmers' perspectives, two studies were conducted in 2018: an impact study and a qualitative evaluation. This section presents the main results of both studies.

The impact study covered 157 randomly selected PIP farmers in villages of the SCAD project, as well as a control group (45 non-PIP farmers)

from villages outside the intervention area where the approach was not implemented (Table 1). The first generation PIP farmers are farmer innovators trained by the project in 2014/2015; the second and third generations are PIP farmers trained by farmer-trainers in two consecutive PIP competitions (2015/2016); and the fourth generation is PIP farmers from adjacent villages where the PIP approach was scaled-up in 2017. Among the interviewees, 60% were male and 40% female. This impact study captured changes before/after PIP and differences between PIP generations in, for example, knowledge, use of practices, motivation, food security, and investments.

The qualitative evaluation study was conducted among 30 PIP farmer families who had started PIP creation in 2016/2017 with the PAPAB project and were purposively selected to capture a diverse set of opinions and experiences. The sample was proportionally spread over three generations of PIP farmers, both sexes, and all six PAPAB provinces. Using the most significant change methodology, interviews focused on (a) changes in behaviour, attitude, and way of living; (b) changes in intrinsic motivation; and (c) changes in collaboration and decision-making within the household. This qualitative study employed informal interviews at the homestead of each family, and allowed to gain in-depth insight into the changes at household level from the perspective of the farmers. As such, it provided rich information and added value to the more quantitative impact study.

6 | FINDINGS

6.1 | Impact on land and farms

Land stewardship by implementing better and more diverse conservation practices is central in the PIP approach. Figure 3 presents for different PIP generations[3] the change in use—before and after PIP creation—of four key conservation practices: compost pits (with a roof, well managed), agroforestry (trees on the farm), contour trenches (slow-forming terraces with vegetation on the bund), and mulching (mainly for perennials). Figure 3 shows that most of the first generation PIP farmers currently use all four practices. This percentage gradually decreases for later generations, where it is remarkable that the fourth generation adopts conservation practices very fast after having created their PIP. These farmers from adjacent villages are often farmers who have heard about PIP from their fellow farmers in initial PIP villages, and eager to start as well.

Particularly important for erosion control are trenches on the contour, which require considerable effort and labour, but are nevertheless quickly adopted by almost all PIP farmers. The same applies to the integration of trees on the farm, which is done by about 30% of the farmers before they start with PIP, but currently by more than 90% of them. Similar trends of fast uptake by PIP farmers is also seen for other practices such as contour ploughing, crop rotations, staggered row planting (especially for banana trees), and the use of vegetable gardens. This integration of a diversity of conservation practices on a field is essential for restoring soil fertility and reducing soil losses, and contributes to farm resilience. Farmers experience these changes and appreciate the trainings and the knowledge they have gained, as expressed in the qualitative evaluation by this second-generation PIP farmer:

> With the PIP approach, I feel able to prepare for my future because I have received the whole technical package to increase agricultural production. […] Even if the project stops today we will continue because the knowledge we have received from the project is sufficient for the implementation of our PIP. The PIP has developed us a lot, we can't stop".

Gaining the technical knowledge to implement and maintain conservation practices is crucial for sustainable land management. In the PIP approach, this is mainly done from farmer-to-farmer and on the farms, allowing as such that—next to agro-technical knowledge—farmer-trainers exchange their experiences, vision, and inspiration. Figure 4 shows how different PIP generations rate the knowledge they have gained over the past years for a variety of crop and land management practices. Non-PIP farmers score close to zero for all practices, meaning that even some basic agricultural practices such as good planning of crop rotations and contour ploughing seem to be unknown to them. This changes rapidly after the PIP trainings, with the first and second generations affirming to have acquired (much) more knowledge on all practices, and third and fourth generations scoring just a bit lower. PIP farmers thus quickly become eager to learn from others and start actively approaching farmers who know more. The quote below of a third generation PIP farmer of 65 years old illustrates this different mindset of farmers after PIP creation, and their willingness to learn about good land stewardship:

TABLE 1 Number of farmers surveyed per PIP generation, divided over gender (male/female), province and their totals

	First generation			Second generation			Third generation			Fourth generation			Non-PIP			
	M	F	Total	M	F	Total	M	F	Total	M	F	Total	M	F	Total	Total
Gitega	5	5	*10*	6	9	*15*	5	8	*13*	13	6	*19*	7	8	*15*	*72*
Makamba	7	3	*10*	7	8	*15*	6	9	*15*	7	3	*10*	11	4	*15*	*65*
Muyinga	6	4	*10*	9	5	*14*	7	9	*16*	5	5	*10*	15	0	*15*	*65*
All provinces	18	12	*30*	22	22	*44*	18	26	*44*	25	14	*39*	33	12	*45*	*202*

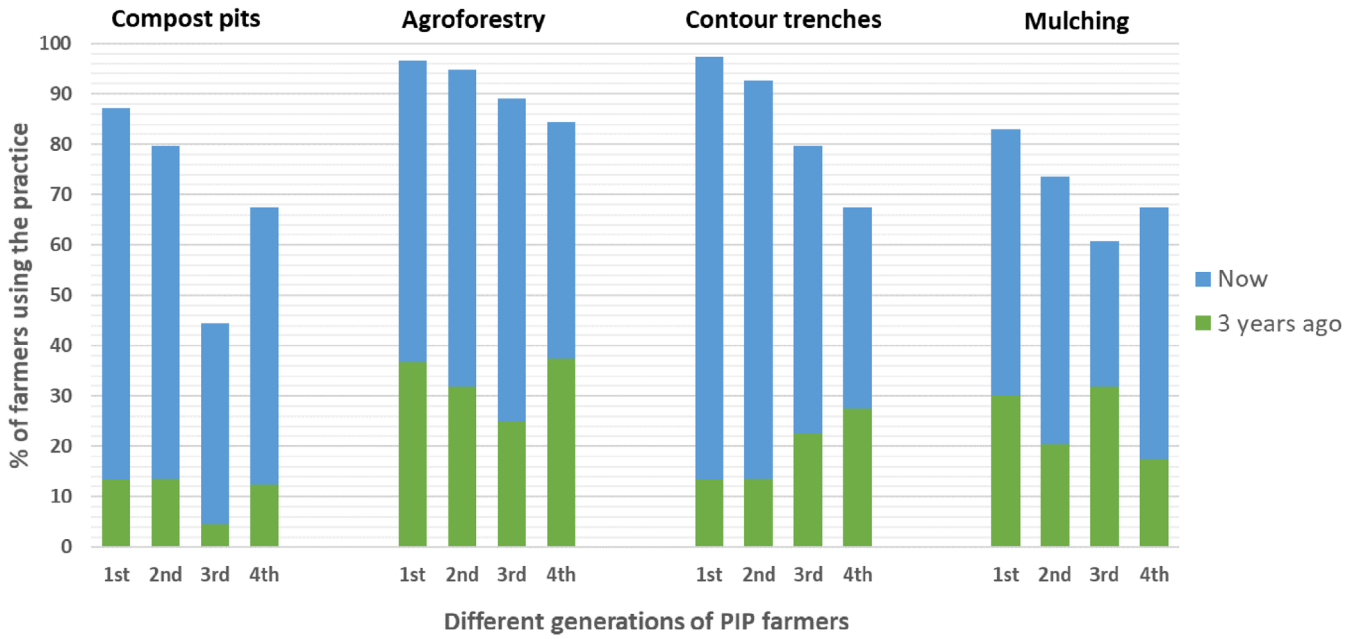

FIGURE 3 Change in use of four different land stewardship practices, across PIP generations [Colour figure can be viewed at wileyonlinelibrary.com]

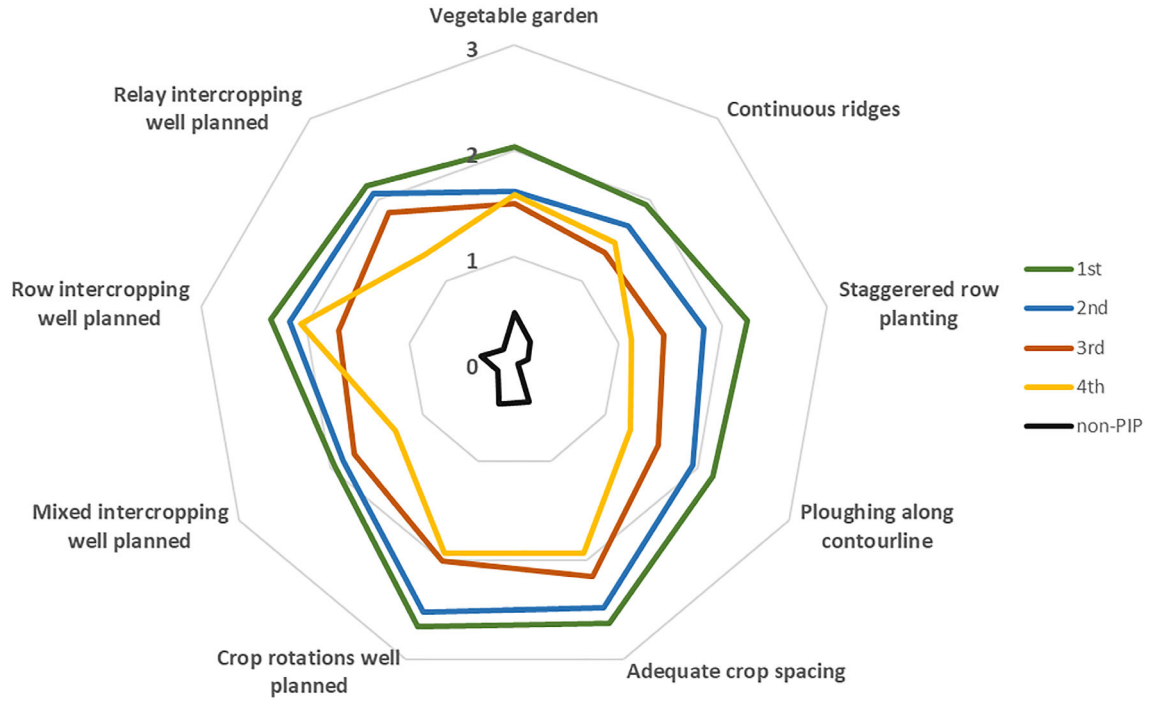

FIGURE 4 Change in knowledge concerning different crop and soil management practices, across PIP generations (with 0 = practice unknown; 1 = same knowledge; 2 = more knowledge; 3 = much more knowledge) [Colour figure can be viewed at wileyonlinelibrary.com]

At village level, the PIP approach is the basis for collaboration between community members, and as a third generation PIP farmer I make household visits to other generations of PIP farmers to ask them for technical advice. They do so with pleasure, something that was not done before PIP".

Increased diversity on PIP farms is noticed by the number of crops, with PIP farmers having 16–19 different perennial, annual, and vegetable crops on the farm, while non-PIP farmers have only 12. More vegetables and some extra perennial crops contribute to this difference, with the increased use of kitchen gardens as an important driver. Some of the new crops are cash crops, and income from cash

crops has increased by 85–100% for all PIP generations. Noteworthy too is that PIP farmers, in particular those working longer with PIP, invest more in livestock than non-PIP farmers, especially in cows and goats. Livestock keeping is an important element of farm resilience and is now being more frequently integrated on PIP farms.

6.2 | Impact on people and households

About 90% of all PIP farmers in the impact study affirm that they are more willing to stay in the village than 3 years ago. A similar percentage considers that living and farm conditions have improved after having created a PIP, with an income increase not only from cash crops but also from off-farm activities and entrepreneurial initiatives. Furthermore, PIP farmers explain in testimonies that due to their new spirit to develop and invest in their future, they have better access to financial capital (credits). The assessment of farmers' recent investments shows that the first generation is most successful in generating more income. However, also other PIP generations improve their living conditions, as this second generation PIP farmer explains:

> Currently in my household, following a good climate of understanding between my wife and children, with the creation of our PIP we are very healthy. We produce enough, we eat to our satisfaction with variations […]. The school fees of 5 children and health care expenses for all members of my family are covered. We live in a house of which I have renewed the roof with 30 metal sheets purchased from the income generated by agriculture and savings groups".

Results furthermore show that PIP households are considerably more food secure than non-PIP farmers in the months after the important bean-producing season (July–September), and keep their stock of produce for a longer period. Non-PIP farmers are back on the food security level of 'we can just manage' already in September, while half of the PIP farmers remain until December on the level of 'we have enough to eat'. The flywheel effect of working with PIP and becoming more food secure, also through new off-farm activities, is testified by this third generation female PIP farmer:

> This small business I started with PIP in addition to farming has allowed us to increase household incomes and change the diet. For this reason, the disputes in our household have totally disappeared because the cause was poverty and the lack of consultation on the different activities to be done".

The previous quote also shows how creating a PIP has changed household dynamics, and triggers families to start implementing their planned activities. Results from the impact study indicate that more than 50% of the third and fourth generation PIP farmers are within a year already halfway the implementation of their PIP. Important in this process is how farmers transmit their passion to others and are able to mobilize them, as illustrated by this second generation PIP farmer:

> At the community level, our family has engendered a more harmonious understanding in other households, after they had heard my wife's testimony about how she has changed. The other households were surprised because of this radical change in behaviour. Now she is the one who is mobilizing other households to adhere to the PIP approach because she has lessons to share. In fact, the community calls us 'the PIP household' ".

To assess motivation, responses by farmers on a set of open questions concerning their future prospects, concrete objectives for the farm, and planned investments, were converted into a "motivation score" for each household. Although subjective and based on the what farmers tell, Figure 5 shows a clear pattern of gradually declining motivation from the first to the fourth generation, being lowest among non-PIP farmers. This seems to suggest that the longer farmers work with the PIP approach the more motivated they become. The qualitative evaluation confirms that the PIP approach has a positive effect on the intrinsic motivation of PIP farmers, especially on their sense of competence to implement their PIP and the planned farm/land practices, as well as on their sense of purpose toward this plan. PIP farmers also often express that they are proud of what they achieve and feel more esteemed than before, both within the household and in the village, resulting in more collaboration and exchange of knowledge. This is nicely expressed by this second generation PIP farmer:

> The training I received helped me to start helping my wife. When I am working with her in the field, not only do labour costs decrease but my wife is proud of my presence and I manage to provide advice on the organization of our work".

These inter-household improvements in relations between the family members are a key result of the PIP approach. Good relations and understanding within a household foster social resilience and are the basis for developing all kind of activities together. In that sense, the following testimony of a 25-year-old lady from the third generation of PIP farmers expresses clearly what the process of PIP creation can do:

> With the problem tree, I identified what was wrong in my household: the lack of dialogue, mismanagement of household assets, lack of vision and planning, and my husband who loves alcohol a lot and leaves all activities to me. […] With the solution tree, [I realize] we should improve family dialogue, break the fear of talking to my husband, and share the new knowledge acquired with him, because the PIP is not individual, it is a household PIP".

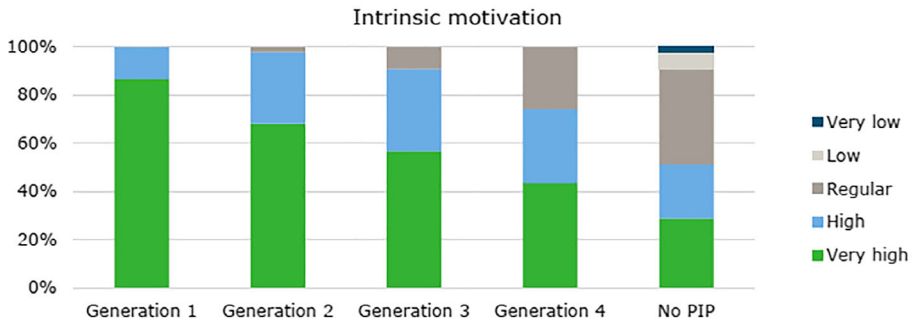

FIGURE 5 Assessment of motivation of farmers to invest in their farm, across different PIP generations [Colour figure can be viewed at wileyonlinelibrary.com]

7 | LESSONS LEARNED FOR A DIFFERENT DISCOURSE

The findings presented in the previous section reflect the combined effect of all foundation and guiding principles of the PIP approach. This section discusses the main lessons learned from these findings, and presents building blocks for a different discourse on *how* to engage people in tackling land degradation and mobilize farmers for sustainable change.

The most important finding is that PIP farmers apply and maintain more conservation practices than non-PIP farmers, and that they do this generally on their own initiative, without being paid (as most former programs used to do). To a large extent this is based on enhanced intrinsic motivation, with numerous testimonies showing that PIP farmers have become more passionate and knowledgeable about sustainable farming, and engage more in pro-environmental actions. This is what they pass on to other farmers, particularly during collective (group) activities. Putting emphasis on such collective learning and action is a key aspect in the PIP approach. During such occasions, awareness grows about common biospheric values and the importance to conserve natural resources, which triggers pro-environmental engagement (Bouman, Steg, & Johnson-Zawadzki, 2020).

However, also extrinsic motivators are at play, especially the motivation to produce more and the expectation to gain a higher income from farming. Almost without exception farmers testify that creating the PIP is a real game changer: by envisioning the future, planning activities together and seeing quick results (often in improved yields), farmers start to invest in good land management practices and become more resilient in all respects (by gaining more knowledge, diversifying income sources, planting a diversity of crops, improving social relations, etc.). This change in mindset, to what farmers often refer to as 'PIP has opened my eyes" 'or 'PIP allowed me to look far', is the crux of the PIP approach, and explains why even in the third and fourth generation PIP farmers—who only recently before data collection created their PIP—effects are already visible on the farm and in the household. Such farmers are proud of what they have achieved, and therefore eager to pass their knowledge and experience to others. This attitude, this sense of stewardship, and the motivation to improve as a farmer household, are key in mobilizing farmers to stop land degradation at scale.

The potential of the PIP approach to scale-up is supported by the findings as well. Large numbers of motivated farmers—even in adjacent villages—have created a plan and are now investing in their land. Farms in Burundi are small, and as farmers usually do not see any option to make a living from their land, investing in conservation practices is not a logical choice. This changes when the PIP starts spreading, with PIP farmers telling others—thanks to enhanced social capital (Pretty, 2003)—how they have improved their farms and living conditions with their own means. Furthermore, the fact that everyone, even poor or illiterate families, are able to envision, draw, plan, and implement practices according to their needs and capabilities, is probably an important reason for the fast uptake of PIP creation. The same applies to women, who are often among the best farmer innovators and trainers. PIP staff facilitates that information flows from farmer-to-farmer, and that farmers feel able to do it and change—often together with others. This collective motivation grows stronger in time, particularly during the process of village vision development, when all kinds of actions are undertaken that require a communal approach (such as digging trenches, constructing roads, and planting trees). Such initiatives are currently on-going in all PIP villages, and are in sharp contrast with the usual wait-and-see mentality in Burundi, which is often due to incentive-based intervention strategies that undermine the power of farmers to act.

This brings us to the PIP guiding principles, and how to create enabling conditions for sustainable change. Supported by several of the presented testimonies and following from the preceding discussion, empowerment appears as a key driver of the measured changes in PIP households and villages. It is cross-cutting the PIP approach, but particularly crucial at the start, when farmer innovators and their families become the first to create a joint vision and motivated to implement their plan. However, this ownership and the proudness about achieving set goals is visible in all PIP generations, which shows that empowerment also works during the farmer-to-farmer trainings and informal visits. Farmers often express that social cohesion has grown in PIP villages, that there is a new dynamic, with more people motivated to learn and improve. Creating this dynamic is an important enabling factor in tackling land degradation at scale, and is achieved by always emphasizing collaboration, the second PIP guiding principle. Testimonies show the enhanced collaboration within households, but also within the numerous entrepreneurial groups that have emerged and now sell their produce collectively. This illustrates the importance of the third guiding principle, integration, with farmers undertaking more income-generating activities, actively engaging with others, and applying more diverse land and crop management practices on their farm.

Despite these promising findings that provide initial support to the PIP approach, more studies should be conducted to fully understand the key-factors at work in the PIP approach, assess its sustainability and limitations, and analyze PIP principles more in-depth and how they correlate. Nevertheless, given the rapid upscaling of the PIP approach in Burundi and its recent application in other (neighboring) countries, we finalize this discussion with five key lessons learned so far, which also provide the core elements of a different discourse to stop land degradation:

1. *Empowering people is essential*: facilitate people to become actors of change, by enhancing their intrinsic motivation, building on local capacities, and by not using incentives.
2. *Development starts at household level*: facilitate households to visualize their vision in a plan, and foster concrete joint action by capacity building and gender equality.
3. *Tangible improvements are key*: focus on achievable goals that generate short-term visible impact, based on better planning, integration of practices, and good land stewardship.
4. *Mobilizing people creates impetus*: stimulate farmer-to-farmer exchanges to mobilize whole villages, and enhance collaboration, social cohesion, and trust.
5. *Impact requires institutional engagement*: train staff of (implementing) organizations and (local) authorities in PIP principles, to provide enabling conditions for scaling and impact.

8 | CONCLUSIONS

This article started with the question how to engage people in tackling land degradation at a wide scale in Burundi, and presented the PIP approach as a bottom-up inclusive approach that empowers and mobilizes farmers to undertake action. Findings and farmer testimonies provide initial support that the PIP approach generates considerable changes at household, farm, and village level. Conservation practices on the farm and better land stewardship are now on-going and go hand in hand with changes at household level. But there are also signs of people having changed their mindset, with PIP farmers becoming more self-determent, collaborative, and willing to learn from others. Visualizing a more resilient and productive future farm in a drawing and planning actions within the household, seem to give these families a clearer purpose and more direction for motivated action and pro-environmental behaviour. First signs of change are promising, with numerous families now being more actively engaged in conservation efforts and motivated to invest in their farm.

Although results are preliminary, motivation and ownership of actions by farmers appear to be essential in the PIP approach. This requires to refrain from the use of incentives like cash and food for work, but rather empower farmers to plan and undertake action themselves. Changing to such a bottom-up approach would be a major challenge for the modus operandi of most (development) organizations, including donors, but findings in this article suggest that this change is required to achieve sustainable impact at scale in stopping land degradation. Particularly the enormous potential of transferring knowledge and motivation from farmer-to-farmer is still underexplored, with projects and agricultural extension services still relying too much on traditional top-down incentive-based approaches (Hall-Blanco, 2016).

It is this change within institutions and their intervention approaches that underpins the different discourse on *how* to stop soil erosion that we advocate for in this article. With the PIP approach, Burundi is now taking some first serious steps to tackle land degradation, supported by a growing number of institutional stakeholders who see that empowering and mobilizing all those smallholder farmers to undertake action is the way forward. However, there is still a long way to go, and much more institutional support—especially at national level—is required to achieve impact at scale. Our final plea to development organizations, institutional donors, and government agencies is therefore to start acting upon this different discourse. Everyone's efforts are needed to stop soil erosion, and core elements of the PIP approach may well be applicable wherever there is an urgency to create more stewardship for the Earth and its natural resources.

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CONFLICT OF INTEREST

The authors declare no conflicts of interest.

AUTHOR CONTRIBUTIONS

All authors have contributed equally to this paper.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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ENDNOTES

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[3] Responses of non-PIP farmers on this question could not be checked in the field and are left out.

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