In-situ Conservation of wild forest coffee -
Exploring the potential of participatory forest management
in south west Ethiopia

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Abstract

Maintaining the gene pool of *Coffea arabica* in the forests of South West Ethiopia, where this plant evolved and has its genetic hearth, is a challenge of global importance. Participatory Forest Management (PFM) and Biosphere Reserves (BR) are among the various initiatives being tested to maintain this forest and its biodiversity that includes major stands of wild Arabica coffee. This paper makes a comparative analysis of PFM and BR approaches to conservation as applied in Ethiopia. While BR legislation provides a framework for enforcement, there can be difficulties in achieving this on the ground especially with the pressures from communities on these forests and the limited resources of the state to enforce protection. In some cases because core zones are alienated from communities these areas are seen as open access by local communities and have suffered especially from fires and focused deforestation. An alternative approach for *in situ* conservation of wild coffee using PFM has been explored in South West forest of Ethiopia. PFM, by engaging local communities in the management of forests is believed to increase economic and environmental benefits while reducing costs of conservation..Monthly field monitoring by communities and annual reviews with the government have turned this forest from open access to community controlled. Critically the development of market links and value chains for forest products is motivating communities to maintain and improve their forest. It is hoped that PFM will create a win-win goal – enhancing the role played by the forest in rural development and ensuring the conservation of wild coffee genetic resources.

1. Introduction

The afromontane natural forest in Ethiopia is the only place in the world where coffee *(Coffea arabica)* plant grows wild as an understory shrub (Senbeta 2006). It is considered the birth place and the centre of genetic diversity (Tesfaye 2006) of this globally important economic crop. Conserving the forest and coffee genetic resource is essential for many reasons. First, the coffee sector contributes up to 10% of Ethiopia GDP, generates 70% of Ethiopia's foreign exchange earnings, provides livelihoods for 15 million Ethiopian smallholder farmers, and employs hundreds of thousand citizens along its value chain. Second, it is the most traded agricultural commodity globally. Therefore, conserving the gene pool of Arabica coffee has local, national and global importance. However, uncontrolled deforestation is eroding this important genetic pool of coffee. The proximate drivers of deforestation and forest degradation are expansion of agricultural land, small and large scale coffee cultivation, tea plantations and unsustainable wood extraction. The underlying causes include demographic, economic, legal and institutional factors.

The attempts to reverse losses of forest resources cover the continuum of arrangements, from strict government controlled nature protection to community based management. The strict nature protection approach is usually imposed in a top-down manner despite opposition and resistance from local communities (Brockington 2004). One such conservation effort which attempted *in situ* conservation of wild Arabica coffee and its associated Afromontane forest in South West Ethiopia was the Coffee Improvement Project (CIP) (Teketay *et al.* 1998). Another version of the approach recently introduced to Ethiopia is Biosphere Reserve (BR). In such exclusionary approaches to conservation, communities are either ignorant of or become hostile to the initiative. Moreover, depsite *de jure* claims for strict protection and law enforcement,

governments and conservation bodies have failed to achieve effective institutions and allocate sufficient funds on a sustainable basis to ensure protection. Hence, these efforts have ended up in leaving the forest in a *de facto* open access situation.

Engaging local communities in forest management is expected to increase economic and environmental benefits of the forest, reduce costs of conservation and improve sustainability. One of the interventions built on such devolved rights of forest management is Participatory Forest Management (PFM). PFM has been implemented in the south west forest for over a decade by partners in the South West Forests and Landscape Grouping (SWFLG) and others and its role in biodiversity is currently being explored.

The objective of this paper is to make a comparative analysis of Participatory Forest Management (PFM) and Biosphere Reserve (BR) approaches to conservation as applied in Ethiopia. The relative strengths and weakness of these two different approaches for *in situ* conservation of wild coffee is explored taking the case of South West Ethiopia

2. PFM and BR reserve models: background and principles

Participatory forest management

PFM is applied in many countries across Asia, Sub-Saharan Africa and Latin America. About 35 countries of Sub-Saharan Africa practice PFM today (Barrow *et al.* 2008). It has been estimated that around 25% of forest resources in the developing world are now under some degree of local control (White and Martin 2002) and that forest policies and legislation around the world are increasingly supportive of devolved forest management. The underlying premise of PFM is that sustainable forest management is most likely to occur when local communities develop a sense of ownership, assume the responsibility of managing local forests and are incentivized for their engagement (Ostrom1990; Agrawal and Ostrom 2001).

PFM aims to develop partnership between government and local communities in forest resource management; the government is expected to play more of facilitation and overall monitoring role. It develops local institutions (byelaws and community based organizations) to fill the institutional vacuum at the grassroots and to develop sustainable forest-based livelihood options.

The most important incentives for communities to invest in sustainable forest management through PFM are tenure and user rights. Getting these key incentives in place and strong enough is the key to realise the forest management potential of local people as shown in the devolved forest management equation (Figure 1).

A. FOREST TENURE SECURITY
Legal control of a carefully negotiated and clearly demarcated forest – ending 'open access' and providing clear land tenure and security.

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B. PRODUCTIVE AND PROFITABLE FORESTRY
Legal user rights, forest products marketing and active forest management – helping the forest improve productivity and 'pay its way'

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C. IMPROVED FOREST MANAGEMENT
Community members motivated not to convert forest to agriculture, but rather manage it on a sustainable basis, which slows down or halts deforestation.

Figure 1. The principles under which PFM operates to ensure improved forest management outcomes

Biosphere reserve

A Biosphere Reserve (BR) is defined as "an area of terrestrial and aquatic ecosystem, which is internationally recognized through the Man and Biosphere (MAB) program" (UNESCO 1996). The added value of BR designation lies in the official recognition by UNESCO. These BR sites are nominated by national governments through the focal points for the MAB program and the UNESCO office in respective countries. According to Schaff (2015), as of November 2014, there were 631 BRs in 119 countries. The key criteria of a BR is that they are;

a) a representative of a natural biome,
b) a unique community or area with unusual features of exceptional interest,
c) an example of a harmonious landscape that has resulted from traditional patterns of land use,
d) an example of a modified or degraded ecosystem capable of being restored to a more natural condition,
e) large enough to be an effective conservation unit and to accommodate different uses without conflict,
f) able to provide opportunities for ecological research, education and training,
g) of particular value as a bench-mark or standard for measuring long-term change in the BR as a whole, and
h) covered by long-term legal protection.

BRs are designed and managed by dividing the BR area into three defined zones (UNESCO, 1996):
- **Core areas** - areas of complete protection. Only research with very limited interference is allowed
- **Buffer zones** - their purpose includes the minimization of adverse impacts on core areas.
- **Transition areas -** areas for promoting the improvement of the quality of livelihoods of local communities.

3. Experiences of PFM and BR in Ethiopia

Experiences of PFM in Ethiopia and the South West
PFM was introduced into Ethiopia in the 1990s. Currently, around 2.4 million ha of natural forest, plantation and degraded forestland are managed with PFM. Coverage of PFM has increased with EU/EDF supported projects. Forest policies and regulations at regional and federal levels have given good recognition to PFM. In the south west forest, PFM is being implemented with the support of NGOs such as Farm Africa/SoS-Sahel and NABU in Kaffa forest, the Ethiopian Evangelical Mekaneyesus Church in Bench-Maji forest and EWNRA (along with other members of the SWFLG) in Sheka forest and the WCC-PFM project in Bench Maji forest. .

BR Experience in Ethiopia and the South West
The first two forest BRs in Ethiopia were established in 2010: the Kaffa Forest BR and the Yayu Coffee Forest BR. These were followed by the Sheka Forest BR in 2012. Godere forest which is adjacent to the Sheka Forest BR is a candidate to be the fourth forest BR in south west Ethiopia. The Kaffa forest BR is supported by NABU, a German based agency, while the Yayu coffee forest BR and Sheka forest BR are supported by local NGOs (Ethiopian Coffee Forest Forum (ECFF) and Movement for Ecological Learning and Community Action (MELCA) respectively).

The MAB National Committee of Ethiopia is chaired by the Ministry of Science and Technology and comprises representatives of the Ministry of Environment and Forests, the Ministry of Agriculture, the Ethiopian Biodiversity Institute and various scientific and academic institutions. Requests for the creation of a biosphere reserve are initiated by regional states and then submitted through the MAB Committee for approval by UNESCO.

4. Methods

The material presented in this paper is drawn from project reports and field assessment. Various project reports both by implementers and external evaluators were used including project impact and evaluation reports. Additional information was generated from a commissioned study by the WCC-PFM project to explore the experiences with PFM and BR approaches in the south west. In the study, perception and experiences of local forest dependent households were collected through semi-structured questionnaire interview. This paper is believed to shed some light on the basic differences between the two approaches and preliminary impacts and sustainability as perceived mainly by forest dependent local households.

5. Results: comparison of PFM and BR as implemented in South West Ethiopia

Community control and ownership

PFM relies on engaging local community and other stakeholders in the management of forest. Intensive awareness creation, skill development training, establishment of local institution and transfer of management responsibility and use right to the organized local institution and use of indigenous knowledge are positive attributes of community involvement seen in PFM activities. Capacity building of other actors (mainly Government Officers) may also contribute to the prospect of sustainability of this intervention beyond the projects' lifetime. On the contrary, BR development and implementation as exercised in South West Ethiopia has not been so participatory or empowering of communities so that a free, prior and informed consent is achieved. Rather, it has been a top-down approach where a project-like approach is followed with control external to communities. In some cases, especially in core areas, it has deprived communities of their customary rights to use and manage forests they have depended on for their livelihoods for generations. It is also known that the nomination process of some of the BRs was done in a short period of time (e.g. Sheka in one year) despite the international standard of a minimum of three years nomination process; hence there was not enough time to consult and get consent of the local people.

Approach to Biodiversity conservation

Respondents encountered in various studies agreed that both approaches are pro-forest. However, there is a difference in how to attain this goal. BR relies on government structures and hired rangers/guards and support of specific groups like cultural leaders (Sheka case), with less involvement of the larger mass of the community. In contrast, PFM is guided by management plans prepared and implemented by the local communities and other stakeholders to develop and protect the forest and its associated biodiversity. Compared to the "business as usual" scenario controlled by government, PFM has the potential to achieve better biodiversity conservation conditions than BR, an approach that doesn't define ownership and relies on government resources. Discussants at various areas in the south west explained that the core zone of BR is under risk of open access situation.

Livelihood impact

In PFM, various income generating forest resource based business enterprises are developed and linked to national and international markets to diversify and improve the income of the community. However, BR is highly skewed towards forest conservation and neglects forest-based livelihood development which is a key element in the south west. There can be a high opportunity cost for the community in terms of forgone benefits (collection of wild honey, wild coffee and spices) when core zones prevent traditional uses, as is the case with BR.

Sustainability

A 3Rs (Rights, Responsibilities and Revenues) assessment from two nearby sites in the south west forest where both PFM and BR are being practiced showed that community motivation to protect forests increased by 83% for forests managed under PFM while it declined by 5% for a core zone of BR as compared to the business as usual government controlled situation. The same study also showed that the ownership feeling increased by 64% under PFM while there was no change in ownership feeling for the BR community (Figure 2).
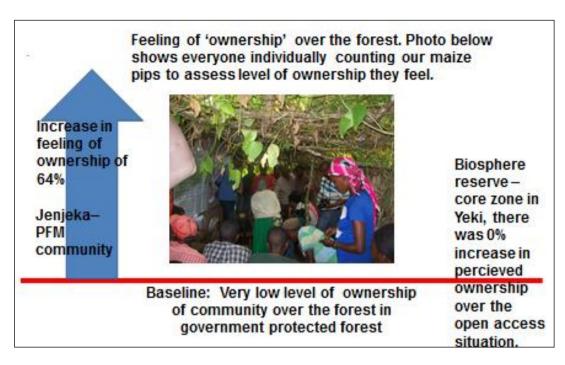
Figure 2. Change in the feeling ownership by the community for PFM and BR.

A summary of the comparison between PFM and BR as understood from consultations of community and other actors is shown in table 1.

Table 1.Summary of comparison of PFM and BR as practiced today in Ethiopia as evidence from SW Ethiopia.

Criteria	BR	PFM
Main actor in the initiative	BR requires that the Government should lead and take the responsibility to ensure protection.	The community is the leading actor and they are responsible to ensure sustainably. Government only monitors.
Principal goal	Protection of biodiversity	Livelihood enhancement and sustainable management of forests and its associated biodiversity.
Institutional arrangement to achieve goal	Paid guards are hired to ensure protection; community involvement is minimal.	Social fencing plus physical patrolling by local community to ensure use in line with approved management plan; annual government checks to ensure the forest is maintained.
Dependence on external agency funds	Relies on either Government funding or outside sources to ensure protection. External funds are needed for the promised rural development in buffer and transitional zones. Limited sustainable financing sources.	Relies on communities' time and motivation based on the rights they have. Furthermore, the forests are sustainably used and there are no promises made about extra benefits. Expectations for additional external support do not exist.
Community support	Community support is weak and ownership feeling is low to non-existent.	Though NGO facilitated, it is more of a grassroots owned process. Creates a strong sense of ownership and transfers management and use rights to organized community and the institutions they develop.
Community involvement	Few people, often an elite, represent the community, while majority are just informed or not at all.	Involves all people living in and around the forest, and all those interested can organize themselves, taking responsibilities and rights.

6. Discussion and Conclusions

PFM in Ethiopia has shown good signs of successfully reducing an 'open access' mentality to natural forest and has demonstrated the benefits of increasing the value of forests for local people through increased local control and user rights, as opposed to trying to delink people and forests (O'Hara 2013). It has been recognised widely that PFM is the most promising approach for motivating communities to engage in forest management in Ethiopia. (Lemenih 2011).

On the other hand, field implementation of BRs in Ethiopia, likewise in many other places (Pool-Stanvliet and Clusener-Godt 2013), both diverge from the basic theories of BR prescribed by UNESCO and have inherent issues affecting ownership and sustainability. The way BR is exercised is primarily a top-down, government centred and strict protection formula; hence they are not basically different from the old conservation projects. Communities are not engaged to the extent they should be and do not "own" BR initiatives, nor are there government institutional frameworks in place and committed to properly manage them. The practice of delinking the community from the core zone rather than empowering them to own, develop, protect and use the resource can have counterproductive consequences that undermines sustainability of the interventions and the resource. Lesser restrictions in the buffer zone may have similar effects. In particular, BR may recreate *de facto* open access situation in core areas. Evidence of this is seen in the way these areas have suffered from fires and focused deforestation. A recent detailed study on forest disturbances in the Ethiopia Afromontane forests estimated total forest loss of roughly 11,000 ha from 2005 to 2012 in the Kafa Biosphere Reserve (DeVries *et al.* 2015). Nonetheless, this doesn't mean that the BR approach cannot work if applied with sufficient economic development and when applied in areas where there is less direct dependence by local people on forests.

It should also be noted that all PFM arrangements are not equally successful. Successes depend on the extent of the rights devolved, the trust between communities and government, the support provided by government and the capacity of communities to create and sustain strong local institutions and develop a sense of ownership (Charnley and Poe 2007; Ribot *et al.* 2010; Amaha *et al.* 2013). Despite still being in the stage of learning lessons PFM is proving successful in improving forest conditions, reducing deforestation and enhancing forest-based livelihoods (Gobeze *et al.* 2009; Amaha *et al.* 2013; Blomley 2013). According to Amaha *et al* (2013) total tree densities per ha was found to be higher in forests under PFM management than in adjacent government protected forest. This finding is similar to other studies that reported positive forest impacts from PFM in Ethiopia (Gobeze *et al.* 2009; Takahashi and Todo 2012).

In general, PFM offers important opportunities for enhancing biodiversity conservation in forests because it is empowering and economically motivating to communities, and is enabling communities to develop institutions and capacity to manage and use the forests in a sustainable way. It is addressing some of the issues which have been faced with BR approaches, especially with respect to local leadership, ownership and sustainability. However, under PFM there is active forest management and manipulation to improve economic returns and this may lead to selective extraction which may alter the ecological structure of forests under PFM. Specific items in PFM agreements along with active government monitoring should help address this. Community interest in the forests and motivation to maintain them is going to be achieved if there are specific benefits and income that can be obtained from the forest. It is hoped that PFM in Sheko will create a win-win goal – enhancing the role played by the forest in rural development and ensuring the conservation of wild coffee genetic resources through specifically observed requirements in the PFM agreements. It is also hoped that the experience gained from such intervention can offer guidance to forest conservation initiatives around Ethiopia and more widely.

Notes
South west Forest and Landscape Grouping: **SWFLG** is an informal grouping of organizations interested in the development of an ecologically sound and socio-economically sensitive approach to the management of the south west landscapes of Ethiopia. The members of the grouping to date are: University of Huddersfield (UK), Ethio-Wetlands & Natural Resources Association (EWNRA), and Sustainable Livelihood Action (SLA)/Wetland Action EEIG (the Netherlands). They have been partners in projects funded by the EU and other international donors since 1996 and have built up specific expertise in the areas

outlined above. Other organizations are encouraged to join the Grouping. Contact: Prof Adrian Wood: a.p.wood@hud.ac.uk

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