POLICY BRIEF

RESEARCH PROGRAM ON Water, Land and Ecosystems

LED BY: IWMI International Water Management Institute

JANUARY 2017

WLE BRIEFING SERIES NO.13

Insights into the benefits of farmer led approaches in promoting sustainable agricultural intensification

Results from the WLE funded 'Improving livelihoods in landscapes in the Volta Basin through strengthening farmer-led approaches to ecosystem-based management' project and the EC-IFAD funded 'Restoring degraded landscapes through selective investments in soil quality in West, East and Southern Africa' project

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WOMEN FARMERS IN NABDAM DISTRICT, WHO DON'T OWN LIVESTOCK, COLLECTING MANURE TO BE BROKEN UP AND MORE EVENLY APPLIED ON THEIR FARM. PHOTO: JULIET BRASLOW

In northern Ghana, as in other parts of the Sahel, agricultural production is not meeting food security needs. Population growth is contributing to land degradation, land fragmentation, decreased grazing land and a reduced livestock population.

Intensifying agricultural systems while ensuring maintenance of ecosystem services, is critical for sustaining livelihoods especially in fragile rural savanna landscapes. Farming families in the Volta Basin areas of West Africa understand the importance of maintaining these services and so implement farming practices that aim to preserve soil fertility, soil health and livelihood benefits. These practices are often considered inefficient or of low productivity compared to conventional agricultural intensification approaches.

More conventional intensification approaches advocate the use of 'modern technologies' such as the application of inorganic fertilizer, pesticides and herbicides. They also generally involve continuously growing the same crop on the same land using improved seeds.

KEY MESSAGES

- Farmers make agricultural decisions based on a holistic understanding of their farm and it's place in and interactions with the surrounding landscape. Because of this they often resist conventional agricultural intensification practices which they see as negatively impacting agricultural and environmental resources in the medium to long term.
- Ecosystem Based Management (EBM) practices have long-lasting positive effects on soils, water resources, trees, grasses and agricultural yields, and have multiple economic benefits that go beyond cash, to include ecosystem services, well-being and quality of life
- EBM should be adopted by women and men farmers and integrated into all agricultural and natural resource management planning and implementation
- Greater investment by government departments, and the development community, in EBM will have a significant, long term positive impact on food security, livelihoods and ecosystem health

Farmers in the Volta Basin find it difficult to finance such approaches or to access the inputs required. Instead they use a variety of practices that aim to maintain soil health and to produce multiple products and benefits from their farms. Rather than pushing more conventional agricultural intensification packages, which are often beyond their ability to purchase, ecosystem based management approaches could be the solution. These would maintain vital services for long-term agricultural sustainability and result in multiple products that help to sustain livelihoods.

Methods and approaches

These two research projects conducted two years of continuous engagement with farming communities in the Bawku-East and West, and Nabdam Districts in the Upper East Region as well as as Lawra and Jirapa Districts of the Upper West Region of Ghana. These activities have resulted in a better, mutual understanding of a number of key factors including; gender based access to ecosystem services, investments in, and adoption of, sustainable land management practices, sustainable fruit tree management value chains, landscape based differences in livestock production, and the use of multi-stakeholder platforms for catalyzing stakeholder engagement and participation.

Policy implications

In the communities studied, culture and tradition, and the system of endorsed values and beliefs that guide them, play a key role in the gender differentiation of how ecosystem services are used, managed and controlled. Land, which is the basis of many benefits, is controlled primarily by men which constrains the benefits women are able to obtain even when they have access to the land. Control over the land often does not equate to ownership of it, and so men can sometimes face constraints too. In part, because of the constraints to their agricultural production, and also because of traditional socio-cultural practices, women have control of, and rely on, a variety of non-agricultural activities that exploit different resources across their landscapes.

Tree resources are especially vital to women in supplementing their food supply and cash income. Shea, dawadawa, baobab, and a variety of fruit and other species provide resources during lean times of the year and make up for food deficits. This is either through consumption or through selling them, enabling women to use the cash to purchase food and other necessities. These trees don't just provide products and raw materials, they also help to regulate water flows and temperature, and reduce soil erosion, as well as providing more indirect culturally important benefits. Many conventional agricultural approaches fail to take these resources, and the benefits they provide, into consideration in planning and implementation. Indeed, many intensification programs often threaten tree species with their emphasis on increased agricultural yields. Following an EBM approach would allow for better planning to protect these critical resources and those who depend on them.

- **Farmers make agricultural decisions based on a holistic understanding of their farm and it's place in, and interactions with, the surrounding landscape. Because of this they often resist conventional agricultural intensification practices which they see as negatively impacting agricultural and environmental resources in the medium to long term.**

Farmers are aware that although inputs like fertilizers and herbicides offer short term benefits they also have negative impacts in the medium to long term. For example, farmers in the communities engaged mentioned that some of their livestock became ill and died from eating grass sprayed with herbicide (to kill the grass before crops are sown) and also after eating crop residues sprayed with insecticides. Improved seeds are welcomed but farmers have encountered difficulties with some seed varieties that are not well-adapted to local conditions. Alternatively, production increases but they are not then able to sell their produce at reasonable prices on the market, leaving them wary of making such investments again. Conventional approaches to agricultural intensification often overlook this wider, more complex context which can be critical in supporting the ecosystems and benefits that farmers depend on.

What is ecosystem based management?

Ecosystem based management (EBM) is a long term, holistically integrated approach to environmental management within a defined landscape that aims to include the full range of interactions within an ecosystem. EBM recognizes that humans are an integral part of an ecosystem as well as having a significant influence on it. So this approach accounts for (for example) the effects of climate change, dams, agricultural practices, air pollution or commercial fishing, etc. on all aspects of an ecosystem. The principal aim of managing natural resources through an EBM approach is to restore and protect the health, function and resilience of entire ecosystems for the benefit of all organisms. This in turn helps to ensure that the ecosystem continues to sustainably provide the many ecosystem services that we rely on for our health, wellbeing, livelihoods, food and recreation.

- **Ecosystem Based Management (EBM) practices have long-lasting positive effects on soils, water resources, trees, grasses and agricultural yields, and have multiple economic benefits that go beyond cash, to include ecosystem services, well-being and quality of life.**

In this way EBM is unlike conventional agriculture practices that focus on short-term technologies. Farming communities should be encouraged, and assisted to invest in and adopt sustainable land management practices. These practices involve the use of a wide range of resources (soils, water and plants, etc.) to produce crops. These, and the ways in which they are produced, need to be flexible enough to be modified over time according to changing demands and requirements. They are sustainable because they aim at ensuring that the resources are

productive in the long-term. Their use does not degrade the environment, ecosystems or the services they provide.

Farmers in the communities studied practice a variety of methods to increase their production while at the same time preserving the ecosystems on which it depends. Over time they have developed a number of practices to enhance productivity and confront the constraints of soil fertility, soil erosion and limited rainfall. However, as the use of agricultural intensification practices have increased to meet the challenges of an increasing population, farmers recognize that soil fertility is declining, soil erosion is increasing and tree cover is being reduced. They are no longer able to rely on shifting cultivation and long fallow periods. Farmers have instead turned to a range of other practices including; crop rotation, manure, compost, stone and soil bunds, grass strips, mulching and rainwater harvesting. Manure, while preferred for soil fertility and quality, is hard to find in sufficient quantities now that livestock numbers have declined.

Famers view these practices favourably, but many find it a challenge to implement them if they require considerable labour or involve significant cash expenditure. So, programs that promote these sustainable land management practices may need to invest in incentives to aid farmers in making the initial investments in their land. A number of these practices are not new to the farmers in the landscapes studied. This suggests that they have a good understanding of the ecosystem requirements and knowledge about how best to support these them so that they continue to provide benefits that the farmers rely on. Some factors negatively impact the adoption of, or capacity to use, these practices. For example livestock was found to be a key factor in the adoption of practices that would improve soil fertility and enhance ecosystems, so their falling numbers is having an impact. Also, the length of time that the results and benefits in enhanced soil fertility take to accrue when compared to the more immediate food and cash needs of farmers can put farmers off relying on them.

ROADSIDE PILES OF FIREWOOD FOR SALE NEAR TAMALE, NORTHERN GHANA DEMONSTRATING COMPETING LIVELIHOOD PRIORITIES. PHOTO: THOR WINDHAM-WRIGHT

- EBM should be adopted by women and men farmers and integrated into all agricultural and natural resource management planning and implementation

Restoring and protecting the health, functions and resilience of ecosystems holistically through effective agricultural and natural resource management is more likely to result in them continuing to be productive for rural communities. For example, an EBM approach can assist in ensuring sustainable fruit tree management. Community members harvest a selection of raw materials from native trees including fruit, leaves, bark and seeds and use them to make diverse products including construction materials, medicine, cooking oil and cosmetics. Examples of the types of trees used in this way include Shea (Vitellaria paradoxa), Dawadawa (Parkia biglobosa), Baobab (Andosonia digitata) and Aura. Harvesting Shea nuts is predominantly a woman's role whereas men, women and youth are involved in harvesting products from other tree types. Women generally process these raw materials and almost all women in the community participate, which is why it's an important aspect to incorporate in project planning.

The trees that provide these products and raw materials naturally regenerate rather than being planted. Most community members indicate that the returns from tree product harvesting and processing help to supplement household incomes. Shea is considered the most important in terms of its contribution. These products and economic activities help provide women, in particular, with cash which is especially useful at times when there are gaps in other sources of household income. Access to the trees, and the products from them, is mostly through ownership of the land on which the trees are situated. Since women are rarely the land owners this can impact their access to trees as they may only have access to trees on their husband's land or on communal land. The number of trees is in decline due to climatic changes and conflicts between the use of these trees for products and cutting them down and using them for firewood and charcoal production. Communities are highly aware of the importance of trees in providing a wide range of ecosystem benefits and said they were keen to plant more, but that tree seedlings often didn't survive after the seedlings were planted. Therefore, it is important to reduce and phase out bush burning, so that natural regeneration of these trees can occur.

An EBM approach to natural resource management can help with livestock production, where access to sufficient quality feed can be a key constraint. Sheep, goat and cattle production is highly dependent on the availability of fallow land and forest ecosystems, where much of their feed grows. The trend for converting grazing land to farmland, without implementing an EBM approach, therefore, has the potential to further reduce livestock numbers which in turn is likely to have a negative impact on soil fertility and ecosystem health. This can then become a self-perpetuating downward spiral which becomes particularly difficult to reverse. It is therefore important to promote the protection of fallow land, through an EBM approach, during planning and implementation.

- **Greater investment by government departments, and the development community, in EBM will have a significant, long term, positive impact on food security, livelihoods and ecosystem health.**

In order for EBM approaches to be better understood and applied, farmers and a wide variety of stakeholders need to be brought into greater and more sustained interaction. Multi-stakeholder platforms, that catalyze stakeholder participation, and training and learning workshops are two effective ways of achieving this. These activities can be effectively geared towards improving awareness and knowledge about more sustainable agricultural practices, ecosystem based land management and the livelihood benefits that arise from them. In these ways, farmers, traditional leaders and development workers have the opportunity to share knowledge, exchange new ideas and develop the new skills needed to put them into practice together.

For any rural development initiative to succeed, the effective and active participation of both stakeholders and beneficiaries in the processes is critical. Local ownership of the process and its results means that those involved are more likely to feel confident in championing their own development agenda. Government departments, and the development community, have an important role to play investing in the development and use of locally relevant EBM approaches by supporting long term, effective EBM focused multi-stakeholder platforms, workshops and training. The outcome would be more food secure rural populations, more sustainable agriculture and ecosystem-based livelihoods, and healthier and more productive ecosystems.

Project participatory videos:

- Don't destroy the environment - https://cgspace.cgiar.org/handle/10568/76982
- "Ti Na Nyang" – "We Can" - https://cgspace.cgiar.org/handle/10568/70145

Acknowledgements

The 'Improving livelihoods in landscapes in the Volta Basin through strengthening farmer-led approaches to ecosystem-based management' project is part of the CGIAR Research Program on Water, Land and Ecosystems (WLE) and supported by CGIAR Fund Donors: http://www.cgiar.org/who-weare/cgiar-fund/fund-donors-2

ABOUT WLE

The CGIAR Research Program on Water, Land and Ecosystems (WLE) combines the resources of 11 CGIAR centers, the Food and Agriculture Organization of the United Nations (FAO) and numerous national, regional and international partners to provide an integrated approach to natural resource management research. WLE promotes a new approach to sustainable intensification in which a healthy functioning ecosystem is seen as a prerequisite to agricultural development, resilience of food systems and human well-being. This program is led by the International Water Management Institute (IWMI), a member of the CGIAR Consortium, and is supported by CGIAR, a global research partnership for a food-secure future.

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