

Review paper

Viable Strategies and Best Practices for Combating Land degradation and Desertification and Poverty Alleviation in Land Rehabilitation Program

Betru Nedessa

Former World Food Program (WFP) Supported MERET Project Coordinator (1997-2019), Ministry of Agriculture (MoA), Ethiopia; and Natural Resources Management, Agriculture and Livelihoods Specialist.
Corresponding Author's Email: betrunb@yahoo.com

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Land degradation, desertification and the recurrent droughts are threatening the well-being and very survival of human beings worldwide in general and the farming communities in particular. The absence or inadequate use of proper land management practices such as conservation farming and application of conservation measures on steep slopes in many farming systems of developing countries are aggravating the problem of land degradation, deterioration of soil fertility and productivity and food insecurity. If we do not take appropriate actions to protect, restore and sustainably manage our lands, we will not be able to achieve our commitments for climate change adaptation and mitigation and biodiversity conservation to assure long-term food security and rural poverty alleviation. Therefore, it is important to sustainably manage, preserve and restore the productivity of our lands. To achieve this aspiration it is crucial to use a range of strategies and best practices having complementarily and synergy to optimize the overall productivity and income while sustainably managing the natural resources. Moreover, linkages, harmonies and partnership among the stakeholders, awareness creation particularly among the farming communities, political and technical commitments should be seriously considered and implemented to successfully achieve the aspirations of the program.

Key Words: Land degradation, desertification, deterioration of productivity, rural poverty, land rehabilitation program, viable strategies, best practices, restore and optimize productivity and alleviation of poverty

INTRODUCTION

Land degradation, desertification and the recurrent droughts are threatening the well-being and very survival of human beings worldwide in general and farming communities in particular. The absence or inadequate use of proper land management practices such as conservation farming and application of conservation measures on steep slopes in many farming systems of developing countries are aggravating the problem of land degradation, deterioration of soil fertility and productivity and food insecurity (Betru, 2019). Studies indicate that while large areas of all continents are experiencing severe land degradation with huge generalized risks, some 40% of the world's degraded lands are found in areas with the highest incidence of poverty, which remains largely in the rural areas (FAO, 2011). If we do not take appropriate actions duly to protect, restore and sustainably manage land, we

will not be able to achieve our commitments for climate change adaptation and mitigation. Besides, we will not be able to alleviate rural poverty and hunger, ensure long-term food security if appropriate actions are not taken duly.

Evidently the causes and effects of land degradation and desertification (LDD) vary from region to region, from continent to continent and among developing and developed countries. Nevertheless, this article emphasizes mainly the situation in developing countries in Africa in general and in Ethiopia in particular based on the author's professional expertise and experiences. The major factor causing land degradation and desertification in developing countries is the miss much between the demand and supply of food, feed and fiber. The human and livestock population growth rates outstrip to a large extent the production and supply growth rate of the above mentioned

requirements and the trend of their growth is conversely co-related (MoA, 2016). While the human and livestock population is growing at faster rate, the growth of the supplies is either at much slower rate or growing in the opposite direction.

These needs will not be met sustainably unless we preserve and restore the productivity of our lands. To achieve this aspiration and land degradation neutrality, it is crucial to use a range of viable strategies and best practices having complementarily and synergy to optimize the overall productivity and income while sustainably managing the natural resources (WYDA, 2020).

Therefore, this review paper briefly describes the root causes of Land degradation, Desertification and poverty with special emphasis on the situation in developing countries and attempts to highlight some practical solutions and best practices to address the problem.

The root causes of Land degradation, desertification and deterioration of productivity

The underlying cause of Land degradation and desertification (LDD) is the rapidly growing human and livestock population that increases the demand for food, feed and fiber from time to time (WYDA, 2020). This, in turn causes the exploitation of the natural resources through deforestation, overgrazing and indiscriminate removal of vegetation cover (MoA, 2016) including crop residues for various purposes. The consequence would be the loss of vegetation cover, biomass, biodiversity, fertility/productivity and food insecurity eventually triggering and aggravating the problem of land degradation and desertification (LDD). Moreover, the absence or inadequate use of proper land management practices such as conservation farming and application of conservation measures on steep slopes are aggravating the problem of land degradation, deterioration of productivity and food insecurity (Betru, 2019).

The other most neglected and hidden factor causing LDD is the abundant loss of rain water as a result of accelerated runoff and flood in absence of proper water harvesting and soil conservation measures (MoA, 2016). The source of all water resources including rivers, lakes, springs, soil moisture and ground water is rain. Thus, the failure to protect the loss of this valuable resource will lead to the depletion of surface and ground water sources causing soil moisture stress that increases aridity and the trends of desertification. The unabated loss of rain water is not only accelerating the trends of desertification and impacts of the recurrent droughts, but also endangers the future opportunities for expanding small scale irrigation, which is thought to be a key strategy for poverty alleviation and promoting adaptation capacity of the farming communities to climate change (WYDA, 2020).

In mixed farming system, free grazing and/or uncontrolled livestock management is one of the major factors causing land degradation, poor agricultural productivity and food

insecurity (MoA, 2005). Free grazing causes destruction of soil structure as a result of trampling and removal of crop residues and hence preventing the recycling of soil organic matter on farmlands (Betru and Kassu, 2009). This affects sustainable soil fertility management undermining productivity and food security with clear implication of environmental degradation. The loss of vegetation cover and loss of soil organic matter increase the level of Co2 emission contributing to the adverse effects of climate change. The uncontrolled livestock grazing system also undermines the efforts of rehabilitation of degraded lands and combating of LDD. Similarly, in pastoral and agro-pastoral areas the miss-match between the livestock population and carrying capacity of the rangelands is the major factor causing environmental degradation and desertification (MoA, 2005).

There is also limitation in efficiently enforcing policies known to be effective in combating LDD at national and global levels. The policies thought to be effective often remain on shelf and not translated into practical actions (Author's Personal Experience). Moreover, it is well acknowledged that the limited/lack of awareness among the farming communities is increasing pressure on the natural resources aggravating the problem of LDD. Likewise, lack of alternative livelihood options and limited technical supports and advices for the farming communities, inadequacy in empowering communities for decision making, loose linkages, in adequacy of integration and holistic development approach (Betru, 2011) are among the major factors retarding the efforts of combating LDD.

The negligence and overlooking of the prevention of natural resources degradation in potential areas is another challenge undermining the efforts of combating LDD. While prevention is the cheapest and easiest method of halting LDD, in most cases, especially in developing countries, there is bias to the rehabilitation of degraded lands in highly degraded environments by investing huge amount of resources (Chadhokar, 2014), but neglecting the prevention of natural resources in the potential areas. Thus, the potential natural resources are deteriorating at fastest rate in these countries undermining the efforts of combating LDD. The need of rehabilitation and restoration of productivity of degraded lands is not debatable as the magnitude of degraded lands is so huge (Betru, 2019) and unless the rehabilitation of degraded lands takes place on massive scale, it would be difficult to restore a balance between demand and supply of food, feed and fiber. Therefore, consideration of both prevention and rehabilitation of the natural resources is so crucial to be successful in the efforts of combating LDD.

Key strategies and best practices to combat LDD and alleviate poverty

Among the effective strategies to curb and eventually do

away with the problem of LDD and poverty is a practical enforcement of the policies endorsed by the UN and agreed by parties. The UNCCD and the world communities should join hands and work together to materialize the implementation of effective strategies and best practices known to address these problems (Betru, 2019). Some of the practical solutions to speed up the success of combating LDD and alleviation of poverty include the implementation of practical strategies and scaling up of the best practices. Effective and practical strategies should be adopted/adapted and implemented worldwide as the earliest possible to achieve the aspired land degradation neutrality and poverty alleviation. It is also critically important to move aggressively towards creating awareness among the farming communities at all levels worldwide. Therefore, effective strategies for awareness creation should be adopted and aggressively implemented at national and global levels. There could be a variety of effective awareness creation methods, but the government and social media should be playing active and leading role in creating the required awareness among the rural farming communities and urban dwellers as required at global, national and local levels (WYDA, 2020).

Agricultural intensification and diversification of livelihoods

This is a system of promoting different agricultural packages and income generation technologies having complementarily and synergy effects on small size of land holdings. The promotion and wider application of agricultural intensification and diversification of sources of income reduces the need of expanding arable lands (MoA, 2016) and hence pressure on natural resources, while allowing farmers to be self-sufficient from small size of land holdings. This can be used as a viable strategy and best practices to combat LDD and poverty alleviation in highly populated and mixed farming systems where the size of land holdings by the majority of farm households is very small (WLRC, 2013). It has been clearly demonstrated in Land rehabilitation projects in Ethiopia for years that a farmer combining various income generation technologies such as high value/cash crops, small scale animal fattening and/or dairy farms with improved forage production, beekeeping, poultry, pond fish culture, etc. on small land holdings can be better off than those cultivating bigger farmlands for cereal production (Betru 2011). Indeed, this requires the integration of small scale irrigation and soil organic matter management techniques and skill of manipulating the diverse activities to sustain the expected superior outputs and benefits.

Controlling land degradation caused by livestock pressure

This can be achieved through various mechanisms such as

increasing the productivity of range lands (grazing lands) and reducing the number of livestock, while also improving their productivity (Adane and Betru, 2012). The various mechanisms for increasing the productivity of range (grazing) lands include: water harvesting and spreading water on the range/grazing lands, moisture conservation, over sowing range/grazing lands with improved forage species. Moreover, removing and eliminating unproductive and weedy vegetation and allowing the rangelands to rest during critical growth stage of plants through the introduction of systematic rotational grazing systems is necessary (MoA, 2005). It is also very imperative to reduce the livestock population pressure on the land by reducing the number of the livestock. This requires improving the productivity of the animals using appropriate animal genetic improvement techniques along with market oriented and environment friendly animal production systems (Adane and Betru, 2012). In the highlands and mixed farming system areas uncontrolled grazing system should be replaced by conservation based land management system.

Ensuring the commitment of responsible bodies

Farming communities stick to their traditional practices whether they are harmful or not in the absence of appropriate advices, technical supports and alternative livelihoods. Technical supports, alternative livelihoods and effective methods of controlling land degradation should be readily available to the farming communities (Betru, 2011). To that end:- qualified, skilled, competent and committed technical staffs should be working with the communities as intimate partners and provide the required technical advises and supports for designing and implementing appropriate technologies (WYDA, 2020). Also there should be more commitment on the part of the responsible government offices to build the capacity and capability of farmers to enable them effectively plan and implement appropriate technologies. Moreover, the following practices should be seriously considered and exercised to increase efficiency, effectiveness and overall performance of the program.

Empowering the beneficiary communities for decision making

The communities should be actively participating in identification of their problems, priority setting, selection of the development options and their implementation and in reviewing of the program and in designing strategies for improvement together with the technical staff (MoA, 2016). All the decisions about the protection, management and utilization of the rehabilitated watersheds should come from the community to develop sense of ownership among the beneficiaries to ensure their commitment for sustainability management and protection of the development works.

Integrated and holistic development approach

Is critically important to prevent fragmentation in planning and implementation of the interventions (Chadhokar, 2014). It enables the integration of diverse disciplines: crops, livestock, natural resources, livelihood packages, etc. in watersheds development program that comprehensively addresses the environmental and socio-economic problems. Moreover, it increases collaboration and harmony among the different actors, increases complementarities and synergy minimizing duplication of efforts and hence increasing efficiency and effectiveness.

Interfacing soil and water conservation with livelihood packages

The integration of income generation and livelihood packages into land rehabilitation program greatly increases the acceptance of land rehabilitation program (Habtamu, 2015).

Particularly the changes in the livelihoods of farmers as a result of using harvested water for small scale irrigation increases the popularity and acceptance of water harvesting (WH) and soil and water conservation (SWC). This completely changes the negative attitude of farmers towards the rehabilitation of degraded lands and greatly improves the popularity and acceptance of the program among farming communities (MoA, 2016).

Capacity building

Practical trainings and capacity building efforts should be an integral part of land rehabilitation program to equip the technical staffs and responsible farmers with the necessary skills and knowledge to enable them properly design and construct high quality and effective soil and water conservation structures (Betru, 2011). This should be supported with the provision of necessary office and transport facilities, etc. to increase their mobility and efficiency in their duties.

Result based Monitoring and evaluation system

Which includes provision of technical supports and on-job-trainings and technical advices at the field level as well as regularly reviewing of the performance of the project by the technical staffs and community representatives is required (WYDA, 2020) to guarantee effectiveness and efficiencies in performance of the program.

Controlling the quality of designs and construction of the SWC structures

This increases effectiveness and efficiencies of the program in addition to preventing the easily collapse of structures that otherwise causes more damages to the

downstream areas resulting in resentment of the program by the beneficiary communities (MoA, 2016).

Piloting of new technologies on farmers' fields

It is important to demonstrate the design and application of new technologies on farmers' fields, before their dissemination to build their confidence for adoption. Piloting of the methodologies on farmers' fields develops interests and confidence of the communities (farmers) to readily adopt and scale up the best practices.

CONCLUSION AND RECOMMENDATION

Land degradation and Desertification (LDD) are a worldwide problem that cannot be addressed in isolation. Therefore, the world communities should join hands and work together to realize the objectives of land degradation neutrality and alleviation of poverty. As agricultural intensification and diversification of sources of income enables farmers to get higher production and income from small land holdings, wider application of its principles and best practices is needed to achieve the same and reduce pressure on the natural resources and to combat the trends of LDD and poverty.

There are many strategies and best practices that can combat LDD and help the realization of land degradation neutrality and poverty alleviation. Therefore, properly documenting, sharing and scaling up of these strategies and best practices is critically important. Partnership among the stakeholders at national and global levels should be strengthened and commitment to work with the farming communities should also be intensified and increased by many folds. The knowledge, skills and experiences spoken about at higher level should be moved down to the grassroots level to solve the problem of LDD and poverty. It is crucial to transform the knowledge and capacity of the farming communities to enable them effectively plan, implement and manage the best practices.

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