

GUIDELINES FOR THE MANAGEMENT OF AGRICULTURE PRODUCTION

1. In most circumstances, agricultural projects which are technically appropriate and efficient will also be environmentally friendly and in accordance with the principles of sustainable development. Amongst the exceptions to these principles are projects which result in the conversion of natural areas of ecological importance such as wild lands, mangroves, tidal marshes, tropical forests, etc. and projects in which indirect impacts favors uncontrolled hunting or logging in natural areas newly accessible. In these latter cases, good agricultural practice cannot alone prevent negative environmental impact. Proper planning, environmental assessment, and mitigation will be necessary. The task of the project manager, then, will be to promote compliance with the BOAD policies and objectives through an assessment of the environmental impacts which involves:
 - a) Seeing that the decision to convert a natural area to agricultural use is an environmentally acceptable one, and that the alternatives have been evaluated where there are environmental questions.
 - b) Ascertaining that indirect impacts have been fully examined and taken into account in planning for project implementation and mitigation.
 - c) Ensuring that good agricultural practices are followed in the design and implementation of projects in the sector.
2. It is not the purpose of the Sourcebook to define good agricultural practices. Information and guidance in that area is readily available from the Technical Departments. Instead, this document is intended to alert

project managers to circumstances which may prevent application of good agricultural practice despite the intentions of BOAD and the project sponsors and to issues that may arise in environmental review of agricultural projects that fall into (a) or (b) above.

3. Sustainable agriculture minimizes soil loss and maintains productivity through use of organic and inorganic inputs in balance with outputs. It takes into account land capability as a fundamental factor in any agricultural investment decisions. It recognizes that agricultural diversification is a key to the functioning of balanced upland farming systems and that external factors, such as road construction to improve market access may be critical in implementing diversification.

Agricultural Practices and Environmental Management

4. Soil conservation and cultivation practices intended to maintain productivity also minimize environmental damage from loss of vegetative cover, increased runoff, soil erosion and siltation. Judicious use of chemicals, both fertilizers and pesticides, is expedient for economic reasons and will either minimize or prevent the eutrophication, groundwater contamination, nitrate accumulation, and evolution of pesticide resistance in non-target species which can result from excessive or indiscriminating applications. Following guidelines for application rates and techniques are usually adequate to protect the environment, except where the substance is used is inappropriate for toxicological, biological reasons. Recycling of manure and other wastes is a common practice and is environmentally protective.

5. Good agricultural practices are likely to be used when they have been defined for the type of project, are managed at the project's scale of operation, advertised and explained to operators, and encouraged through inspection and incentives or sanctions. These practices should be proven to be practical, sensible, and profitable to the farmer, since he or she is ultimately the one who will decide if they should be used or not. This argues for strong links between the farmer and research. Project managers should be alert to conditions that will prevent one or more of the above from occurring. Common impediments are listed below:

- National or sectoral policies that lead to short-term, minimum-cost exploitation of agricultural, forest, or fishery resources and penalize sustainable, higher-cost or slower payout operations.
- Lack of land tenure or other sense of ownership and thus feeling of responsibility for the natural resource.
- Practices being required for loans or credits involve structures or equipment beyond the means of the owners in small-scale operations.
- Shift to intensive production techniques, such as animal feedlots, without accompanying technical assistance in areas such as waste management.
- Lack of well-developed extension service or other outreach institutional structure for education and technical assistance.
- Lack of attention to the differential access of male and female farmers to technologies and inputs.
- Lack of environmental standards applicable to the sector, especially to intensive operations such as feedlots, fish farms, and processing plants.
- Lack of capacity for field inspections to monitor adherence to standards and any required practices, such as for stream-bank buffer zones, reforestation, waste handling;

- Lack of legal basis for enforcement action in cases of environmental damage or violation of requirements.
 - Lack of developed, alternative practices that are acceptable to farmers.
 - Weak or non-existent provisions for dialogue between farmers and agricultural researchers.
6. Most of these questions fall within the "institutional" dimension of Environmental Assessment. They are critical to project success, because of the very fact that, unlike industrial or infrastructure loans or credits, where many of the significant impacts are avoided through design changes or "hardware", so many agricultural sector operations proceed with the provision that there are potential impacts but that they will be avoided or mitigated merely by good practice. If the capacity to promote, implement and, where necessary, enforce good practice is flawed, adverse impacts can be anticipated.

Environmental Impacts

7. It is useful to divide agricultural projects into two categories: irrigated agriculture and rain fed agriculture; each has its own set of potential environmental problems. Impacts of agrochemicals and irrigation are primary concerns. In the uplands, problems of erosion, loss of soil fertility, improper land use and watershed management often occur.. Sustainability in agriculture will minimize soil and nutrient loss, and balance inputs with harvests, and strengthen the links between the farmer, extension and research. Environmental prudence, sustainability, and relevant technologies will be fostered by improving the links between farmer and research.

Major Impacts

8. The main environmental impact to be aware of is the irreversible loss of habitats. It is most critical when it is "natural areas" but even degraded habitats, e.g., urban wetlands, perform valuable services. On one hand, such loss reduces economically valuable environmental services and on the other accelerates extinctions and loss of biodiversity. This loss can occur from two main causes: first, access roads that reach the project area; and second, clearing natural habitat for planting and processing of crops. Access roads leading into the project area or near habitat may facilitate unplanned settlements and destruction of that habitat. Loss of socio-economic services can result in increased pressure or conversion of other lands. If grasslands are converted, for example, grazers will have to graze their herds elsewhere. Indigenous peoples are particularly vulnerable in this situation. Similarly, when clearing new lands for the production or processing of crops, if the new land is wildland or other habitat, and especially if it is critical habitat such as tropical forests, preventive measures, precautions and policies should be used for any guidance sought.

Lesser Impacts

9. The lesser impacts of agriculture are largely reversible and preventable. On occasion, however, they can be severe. The lesser impacts fall into only three categories:
 - a) Agro-chemical runoff contaminating water and ground water
 - b) Pesticide concerns
 - c) Effluent disposal from crop processing.

Prevention or mitigation of these impacts is relatively easy and should be standard procedure.

Land Clearance Methods

10. The way in which new land is cleared for cultivation greatly influences subsequent agricultural success. For example, clearing tropical forest with heavy bulldozers or big chains decreases the thin layer of fertile topsoil, exposes infertile subsoil, and accelerates erosion.

Fuel wood

11. If fuel wood harvested from the wild is used in processing plants or for curing the crop, then that can be a major impact on the environment. All fuel wood needed by such projects should come from fuelwood plantations planted near the processing plant as part of the project.. The environmental assessment should ascertain if crop residues are used for fuel instead of having their nutrients and organic matter recycled to the crops.

Crop-Specific Impacts

12. It concerns coffee, cotton, cocoa, oil palm, sugar and tea: apart from the major impacts from conversion of wildlands noted above, the environmental impacts accrue from processing mainly disposal of highly polluting washing waters.. The main point here is that most effluents can be

profitably recycled. This is especially true for sugar factories, rubber and oil palm mill effluents which are valuable sources of the nutrients needed by the growing crop. Any crop residues, such as bagasse or cacao husks, not used for process steam also should be recycled to the extent possible as stock feed or cardboard, hardboard, or digested for fuel gas and **compost**, etc., rather than being dumped in the nearest creek as was formerly common. Coffee and tea curing and sugar factories and other processing may consume fuel wood as mentioned in paragraph 11 above. Smoke from burning cane fields before harvest is an impact, but properly handled, it should cause more of a nuisance than an environmental problem. Cotton requires more pesticides than most other crops; this becomes a significant potential problem deserving special management.

Tobacco Production

13. BOAD does not invest in tobacco production

Livestock

14. For BOAD, the main impacts are the same irreversibles noted above: access roads facilitating destruction of habitat, and the conversion of habitat for pasture. This is especially serious in the cases of large scale animal breeding and ranches. EA's for ranches, will point to the major irreversible and unavoidable environmental costs.
15. Ranches in natural range routinely need constant monitoring of carrying capacity to prevent overgrazing in the dry years. Domestic cattle are so

dependent on drinking liquid water every day that overgrazing is difficult to prevent around water sources. Therefore, the potential for using non-domestic livestock should be addressed during preparation. These do not need liquid water every day, do not suffer from tsetse and other insects as cattle do; hence, there is no need for biocides. Since they eat a much wider range of vegetation, as well as browse, they can produce more offtake than cattle over the medium and long term.

16. The lesser preventable and reversible impacts are the same as above pesticide concerns, and processing effluents from slaughterhouses.

Fisheries

17. Freshwater fisheries normally have little environmental impact; on the contrary, they are usually highly benign, especially fishponds down slope from the household, which recycles household wastes and sewage leachate to great advantage. Highly concentrated aquaculture operations can pose a potential water pollution problem. But In general, BOAD should do more to promote the fish potential in all relevant water projects, especially in reservoirs.
18. The major impact in shrimp projects is irreversible habitat conversion, especially of mangroves and other coastal wildlands and wetlands

Social Impacts and Human Health

19. Involuntary resettlement occasioned by agricultural projects, especially irrigation reservoirs, is arguably their major impact. The complex issues surrounding involuntary resettlement have not historically been well handled in BOAD-assisted projects; therefore, the Bank has issued detailed policies and guidance in this arena. This is especially so for indigenous peoples. All agricultural projects should address how land is currently utilized within the farming systems, within the local economy, and as a source of nutrition, especially in poor crop years. When land is converted, the project should explicitly plan for substitutions or replacing these lost services, both for equity reasons and to avoid increasing pressure on other areas.
20. Fisheries, livestock development, and irrigation projects can have a negative impact on women's livelihoods and status when interventions increase women's burden without providing them additional assets or income. When mechanized fisheries activities (including shrimp) are introduced, women often lose labor opportunities because they lack new skills and access to marketing.
21. The use of pesticide has negative impacts on human lives and on the environment. The pesticides most often found in human bodies are the most powerful pesticides and which possess bioaccumulation properties