

Biodiversity, agro-biodiversity, international trade and food safety in CCA and PRSP country reports

Major issues of development in the UN System Common Country Assessments and World Bank Poverty Reduction Strategy Papers

P.S. Bindraban, H.L. Aalbers, H.A.J. Moll, I.D. Brouwer, A. Besselink & V.M.J. Grispen



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WAGENINGEN **UR**

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Preface

The Netherlands Ministries of Agriculture, Nature Management and Food Safety (LNV) and of Foreign Affairs (DGIS) recently requested the Wageningen University and Research Centre (Wageningen UR) to perform a review of UN system Common Country Assessments (CCAs) and World Bank Poverty Reduction and Strategy Papers (PRSPs). The objective of the review was to assess to what extent international trade, biodiversity and food safety are analysed in the reports, within the context of food security.

Because of the complex nature of the food security problem, an interdisciplinary team at WUR took up the challenge to execute the review. This team had already performed an extensive review at the request of the FIVIMS secretariat at the Food and Agriculture Organization of the United Nations (FAO). In that project, 50 CCA reports and 25 PRSPs were reviewed to assess the extent to which food insecurity and vulnerability problems are analysed and incorporated into policies, strategies and interventions, and to identify clear areas for improvement.

The review described in this report was performed with great interest, as the country documents have the important aim of developing strategies to improve food security and reduce poverty. While solving these problems is the prime responsibility of national governments, the entire international society is involved and should bear its responsibility. In this regard, the links between national strategies and international agreements are of particular importance. Global issues such as international trade, biodiversity and food safety have no national boundaries and all affect the quality of life.

We have discussed these global issues with various people in order to properly deal with them. For their participation in these discussions, we would like to thank Drs. M.L. Vernooij, Ir. C. Neeteson (LNV) and Drs. F. v.d. Staaij (DGIS) of the two ministries. We further acknowledge the time and input of Dr. ir. I. Heitkonig, Dr. M. J. B. Mengelers and Prof. Dr. A. Kuyvenhoven for providing background information on the thematic areas. Various other people have been involved and committed to ensure successful completion of the review process.

We hope that the information provided will support the development of closer links between international agreements and national strategic plans for improving food security and reducing poverty.

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Glossary

CCA	Common Country Assessment
FAO	Food and Agricultural Organization of the United Nations
FIVIMS	Food Insecurity Vulnerability Information and Mapping System
HIPC	Heavily Indebted Poor Countries
IMF	International Monetary Fund
LDC	Least Developed Country
MDG	Millennium Development Goal
NGO	Non-governmental Organization
PRSP	Poverty Reduction Strategy Paper
UN	United Nations
UNDAF	United Nations Development Assistance Framework
UNDGO	UN Development Group Office
WFS	World Food Summit
WHO	World Health Organization
WTO	World Trade Organization
WUR	Wageningen University and Research Centre

1. Introduction

Over the past years concerted actions have been agreed upon to address global issues such as food insecurity, poverty, biodiversity and sustainable development. Most pronounced are the targets defined in the Millennium Development Goals. These actions may accelerate the implementation of declarations made over the past decades at world summits and international conferences that aim at social and economic progress for enhancing food security and reducing poverty.

The prime responsibility for implementation of agreements has been assigned to national governments, such as on food security and poverty reduction (FAO, 1996; 2002). Concerted efforts by international and national institutions are needed to establish action plans that add up to a coherent strategy for achieving overarching goals related to complex global matters. To this end, the UN and the World Bank have instigated the preparation of country reports that describe the countries' development status and the priorities for meeting the targets (UN, 2003; World Bank, 2003). As of 1 September 2002, 106 countries had produced a Common Country Assessment report (CCA) supported by the UN Development Group (UNDGO) and 47 countries had produced or were in the process of producing Poverty Reduction Strategy Papers (PRSPs), instigated by the World Bank.

The UNDGO is the main UN body promoting UN system reform. It has established a CCA process as a national follow-up tool for international summits (CCA, 1999). The CCA describes the evolution of the national situation, compiling information from a wide range of sources and organisations, as a basis for in-depth analysis of development problems. This analysis is not only restricted to immediate causes, but should also uncover underlying and fundamental causes. The scope of the CCA reports should be broad to be used as a monitoring and intervention tool at sub-national level for problems such as food insecurity and vulnerability. CCA is an essential step in the preparation of the UNDAF (United Nations Development Assistance Framework), a planning framework for development operations of the UN system at country level. It is the foundation for collaboration between UN funds and programmes and local governments.

PRSPs describe countries' macroeconomic, structural and social policies and programmes to promote growth and reduce poverty, as well as associated external financing needs. Governments prepare PRSPs through a participatory process involving civil society and development partners, including the World Bank and the International Monetary Fund (IMF). Completion of a PRSP is a requirement for less developed countries to be eligible for debt relief and for concessional IMF lending under the HIPC agreement. A PRSP aims to describe who the poor are and where they live. It analyses the macroeconomic, social, structural and institutional constraints to fostering growth and reducing poverty and it sets out policies that comprise a comprehensive strategy for achieving poverty reduction.

This document describes the review of 24 CCA reports and 15 PRSPs conducted to assess the extent to which international trade, biodiversity and food safety are analysed in the reports, within the context of food security. This review was performed at the request of the Ministry of Agriculture, Nature Management and Food Safety (LNV) and the Ministry of Foreign Affairs (DGIS), as an extension of the review by Bindraban *et al.* (2003).

2. Methodology

Reviewing the comprehensive global issues of international trade, biodiversity and food safety within the context of food security requires an interdisciplinary team of researchers. Wageningen UR is a knowledge centre with international experience in the fields of food and nutrition, agriculture, natural resources and rural development. Over the past years, a group of over 30 Wageningen scientists from a wide range of social to biophysical disciplines has jointly discussed food security in a series of workshops. They developed a comprehensive view on the various aspects of food insecurity and their interrelations, as well as on the structural and dynamic patterns that cause food insecurity in different countries (Koning *et al.*, 2002). The interdisciplinary nature of this team provides a solid basis to address complex global problems. The team members involved in the current study come from production technical, socio-economic and nutrition-related disciplines.

2.1 Country selection

The countries in this review were selected on the basis of priorities established by the ministries of LNV and DGIS on international cooperation (Table 1).

Table 1. Overview of LNV and DGIS priority countries in 2002 and the CCAs and PRSPs reviewed.

Region	Country	LNV priority country	DGIS priority country	CCA reviewed	PRSP reviewed
Africa	Benin		+	+	+
	Burkina Faso		+	+	+
	Eritrea		+	+	n.a.
	Ethiopia		+	+	+
	Ghana		+	+	+
	Mali		+	+	+
	Mozambique		+	+	+
	Rwanda		+	+	+
	South Africa	+	+	+	n.a.
	Tanzania		+	+	+
	Uganda		+	+	+
	Zambia		+	+	+
Asia	Bangladesh		+	+	n.a.
	China	+		+	n.a.
	India	+		+	n.a.
	Indonesia	+	+	+	n.a.
	Iran	+		n.a.	n.a.
	Sri Lanka		+	+	n.a.
	Vietnam		+	+	+
Arab States	Egypt		+	+	n.a.
	Yemen		+	+	+
Latin America	Argentina	+		+	n.a.
	Brazil	+		+	n.a.
	Bolivia		+	+	+
	Nicaragua		+	+	+
Europe	Macedonia		+	n.a.	+
Total		7	21	24	15

2.2 Biodiversity – Agro-biodiversity – International trade – Food safety

LNV and DGIS expressed interest in four thematic priority areas: nature, biodiversity, international trade and food safety. Hence, background information was collected to provide the researchers with a comprehensive understanding of each of these themes. The policy relevance of each theme was investigated through discussions with policy makers and compilation of policy documents on the specific areas. Thematic information was also collected through discussions with specialised scientists in the various areas.

Based on this background information on the thematic areas the research team decided to combine nature and biodiversity, as biodiversity is seen as the variation in nature. As agreements on biodiversity refer to both the non-use and use functions of biodiversity, an additional dimension of agro-biodiversity was added to the review. Agro-biodiversity also relates more directly to food security.

To review biodiversity, agro-biodiversity, international trade and food safety issues concise questionnaires were developed based on the questionnaire used by Bindraban *et al.* (2003). The questionnaire evolved from information attained from previews of some CCA reports and PRSPs, the UN Millennium Development Goals, the Convention on Biological Diversity and other sources. It comprises main questions that can be answered with a simple yes or no, and corresponding sub-questions that require more elaborate answers. Hence, the questionnaire can provide data for quantitative and qualitative analysis.

2.3 Review process

As this review was less extensive than the review conducted by Bindraban *et al.* (2003), the review of the reports was based on keyword lists. The keywords were derived from the information attained in literature and discussions with policy makers and specialists. Hence, the CCA reports and the PRSPs were screened for these specific priority areas using the keyword lists (see Section 2.1.2. and Appendix 2).

The questions in the questionnaire are grouped under six headings that reflect the general process of policy analysis. The four thematic areas are treated individually under the headings three to six. The headings are divided as follows:

1. Identification; questions regarding technicalities of the report
2. General; questions regarding the analysis itself and the country in general
3. Definition; questions probing into the definitions used for food security and the thematic priority areas
4. Data collection and analysis; an elaborate set of questions regarding links to food security, interacting developments and indicators for the thematic priority areas
5. Policy statements; questions regarding links between food security and the thematic priority areas in formulated policies
6. Suggested policies, strategies and interventions; questions regarding links between food security and the thematic priority areas in future policies and interventions.

The questionnaire consists of 192 questions (115 main questions and 77 sub-questions) grouped under the six headings (Appendix 1). The questionnaire is in the format of a spreadsheet (Excel), which enables vertical entry of answers into one column and thereby an easy transfer of each data set to one central database. The phrasing of the questions leads to 115 numerical answers, which facilitates data processing.

The data of the countries reviewed for this interim report were combined into one data matrix of fourteen rows and 192 columns representing the countries and questions respectively. Analysis was carried out predominantly with the tools available in the spreadsheet program.

3. International trade

International trade is defined as trade from persons or institutions in one country to persons or institutions in another country. International trade is accompanied by national and international regulations that may include licensing, tax payments, and standard contracts. Besides this regulated international trade there is also informal international trade, called smuggling or traditional trade, the latter term acknowledging ancient trade routes that crossed continents and seas. The focus in official documents, CCA reports and PRSPs is on the official international trade.

International trade is regularly subject to debate. In the 1960s and 1970s the dependency theory (Prebisch, 1984) claimed that international trade invariably results in exploitation, with the Northern countries ('the centre') as beneficiaries and the Southern countries ('the periphery') as the exploited. The theory affected trade and industrial policies of especially the Southern American countries, which protected the domestic industries and restricted international trade. At the same time a number of countries in Southeast Asia developed their industries through a strong orientation on export. Experience showed that the development of emerging national industries behind closed borders did not result in efficient and innovative industrial firms. Instead, industrial elites emerged with close ties to the government that enabled them to maintain their preferential position. In contrast, the Southeast Asian countries developed into the New Industrialised Countries and earned the name 'tigers' (Stiglitz, 1994). These developments were associated with rising living standards for the population and a massive reduction of poverty.

Developments observed in the past must be considered against the background of period, location and international relationships in general and therefore cannot lead to straightforward prescriptions for the future. The present differences of opinion about the future are reflected in the debates around the Doha Declaration of the WTO. This review gives the positions of the individual countries in these debates as reflected in the country studies.

3.1 Position of international trade in country studies

International trade is mentioned in nearly all country studies, but the subject is discussed in some detail in 67% of the studies (see Table 2).

The countries that produced both a CCA report and a PRSP deal generally with international trade in a similar way in both types of reports. Therefore no distinction will be made between the two types of reports in the discussion of specific aspects below, unless specifically required.

The meaning of 'international trade' is apparently not subject to debate, as none of the country studies provide a definition for the term. Few country studies deal with international trade in a separate section or subsection, and international trade is discussed in more than one section of the studies in relation to a range of issues. Four of the issues that are frequently mentioned in connection with international trade are stated in Table 3.

The linkage between international trade and food security refers to imports for all countries except one, Vietnam. This country report states that increasing production resulted in an increase in exports and food security simultaneously. In some of the statements a link is made with food insecurity and poverty, see also Section 4.3.

The discussion of problems related to international trade differs in focus and in detail. Several countries state domestic restrictions in either physical infrastructure (Benin, Burkina Faso, and Mozambique) or in legislative procedures (Nicaragua, Vietnam) that have been or still are limitations to their participation in international trade. Other countries (Ethiopia, Ghana, Rwanda, Uganda and Vietnam) discuss the vagaries of international trade affecting the few export products they have. Some of these countries also mention the need for, or their actions in pursuit of, diversification of export products. Brazil, as a major exporter of agricultural commodities, mentions the farm subsidies in rich countries as one of their problems. Two countries (South Africa and Benin) include positive statements in their review related to their advantageous geographical positions.

Table 2. *Position of international trade in country studies.*

Region	Country	Main issue in CCA	Main issue in PRSP
Africa	Benin	yes	yes
	Burkina Faso	yes	yes
	Eritrea	yes	-
	Ethiopia	no	no
	Ghana	yes	yes
	Mali	no	yes
	Mozambique	no	yes
	Rwanda	yes	yes
	South Africa	yes	-
	Tanzania	no	no
	Uganda	yes	yes
Zambia	no	no	
Asia	Bangladesh	yes	-
	China	yes	-
	India	yes	-
	Indonesia	no	-
	Sri Lanka	no	-
	Vietnam	yes	yes
Arab States	Egypt	yes	-
	Yemen	no	no
Latin America	Argentina	yes	-
	Brazil	yes	-
	Bolivia	no	no
	Nicaragua	yes	no
Europe	Macedonia	-	no
Proportion 'yes'		0.67	0.67

The link with liberalisation mainly focuses on liberalisation of the national economy in order to operate on the increasingly liberalised international market. Most studies mention the need to improve national competitiveness, and many refer in this respect to the WTO. The studies go, however, well beyond such a general statement and report specifically on the markets that have been liberalised. Benin and Nicaragua, for example, report on the abolition of state organisations and the resulting emergence of private enterprises. Some countries (Egypt, Ethiopia, Uganda, Vietnam and Zambia) are positive about the liberalisation, while others (Indonesia and South Africa) state both positive and negative consequences. The statement on industry in the PRSP of Ghana summarises the subject adequately: 'Liberalisation and market-orientation were conditions necessary but not sufficient for sustained industrial development'.

The regional trade organisations mentioned in the studies are stated under the heading Regional Integration. For the West African countries WAEMU (West African Economic and Monetary Union) and ECOWAS (the Economic Community of West African States) are mentioned. The southern African countries mention SADC (the Southern African Development Community) and COMESA (Community of Eastern and Southern African Countries). Vietnam states ASEAN (Association of Southeast Asian Nations) and APEC (Asia Pacific Co-operation). Yemen mentions the AGCC (Arab Gulf Co-operation Council) and the South American countries state MERCOSUR, the common market for South American countries. It is remarkable that some countries that are members of regional trade organisations do not mention them in the country studies, e.g. Indonesia, a member of ASEAN.

Table 3. Discussion of international trade linked to main issues in CCA reports and/or PRSPs.

Region	Country	Food security	Trade problems	Liberalisation process	Regional integration
Africa	Benin	no	yes	yes	WAEMU ECOWAS
	Burkina Faso	no	yes	yes	WAEMU
	Eritrea	no	yes	no	
	Ethiopia	yes	yes	yes	
	Ghana	no	yes	yes	ECOWAS
	Mali	yes	yes	yes	WAEMU ECOWAS
	Mozambique	yes	yes	yes	SADC
	Rwanda	no	yes	yes	COMESA
	South Africa	yes	no	no	SADC
	Tanzania	no	no	yes	
	Uganda	no	no	yes	
	Zambia	yes	yes	yes	COMESA SADC
Asia	Bangladesh	yes	yes	yes	
	China	no	yes	no	
	India	no	no	no	
	Indonesia	yes	yes	yes	
	Sri Lanka	yes	no	no	
	Vietnam	yes	yes	yes	ASEAN APEC
Arab States	Egypt	yes	yes	yes	
	Yemen	no	yes	yes	AGCC
Latin America	Argentina	no	no	yes	MERCOSUR
	Brazil	no	yes	yes	MERCOSUR
	Bolivia	yes	yes	yes	MERCOSUR
	Nicaragua	no	yes	yes	
Europe	Macedonia	no	no	yes	
Proportion 'yes'		0.44	0.72	0.80	

3.2 Data on international trade of agricultural commodities

The data on international trade in general are limited to statements regarding groups of products and services. Most countries are more specific with regard to agricultural products and the following products were stated as being imported or exported (Table 4).

The way country studies deal with the imports and exports differs widely: some countries do not state their traded products at all, while others apparently omit major products. The differences in treatment of quantitative indications are even greater: some reports use statements such as '*major products exported*' and '*agricultural products count for 75% of export earnings*' or they express export performance as a percentage of imports; other reports are more precise with regard to traded products, providing quantities and values. The statements are often in narrative form and linked to issues such as food availability, foreign investments, government budgets, and other issues that are of specific national relevance.

Table 4. Major products stated as being imported or exported.

Region	Country	Products imported	Products exported
Africa	Benin		cotton, palm oil, cashew nuts, pineapple
	Burkina Faso	dairy products	cotton, cottonseed oil, livestock, meat
	Eritrea	food grains	cotton, fruits, vegetables, livestock
	Ethiopia		coffee and chat
	Ghana	cattle, sheep, frozen meat, dairy products	Cocoa
	Mali	rice, wheat	cotton, meat, livestock, cereals
	Mozambique		raw cashew nuts
	Rwanda		rice, maize, potatoes, soya, beans, tea, coffee
	South Africa		
	Tanzania		
	Uganda		coffee, cotton, tea, tobacco, fish, cereals, beans
Zambia	maize, grains	cut flowers, fresh vegetables	
Asia	Bangladesh	Grains	frozen food
	China		
	India		
	Indonesia		shrimp, tuna
	Iran		
	Sri Lanka		rice
	Vietnam		
Arab States	Egypt	wheat, maize, sorghum, sugarcane	cotton, rice, potatoes, tomatoes, strawberries, fruits, vegetables
	Yemen	Cereals	
Latin America	Argentina		wheat, maize, sorghum, soya, sun flower oil, soya oil, sugar, fish, meat
	Brazil		grains, lobsters
	Bolivia	Wheat	quinoa, camelidae
	Nicaragua		coffee, sugar
Europe	Macedonia		

Tariffs and non-tariff trade barriers directed at imports, and export taxes or export subsidies and exchange rate regimes are mentioned in 25% of the CCA reports and in 60% of the PRSPs. Again, as with the commodities, the statements regarding tariffs and taxes are fragmentary and may refer to single products or to groups of products. Not surprisingly, the statements reveal a reduction of tariffs and non-tariff barriers, often in relation to regional or world-wide trade agreements, and a reduction of export taxes and product subsidies. Where stated, the exchange rate liberalisation has benefited the prices of export crops, and one country mentions additionally the reduced, but still existing, bias against agriculture.

An overall summation of international trade in the form of a trade balance is given in 62% of the country studies, generally for a number of years. Most of the statements refer to a negative trade balance with the exception of three countries that report a positive trade balance (Argentina, Bolivia and Tanzania).

3.3 Policies, strategies and interventions

Nearly all of the country studies reviewed, 23 out of 25, describe policies, strategies or interventions to increase their international trade. Various reasons are given to explain why the government should increase international trade, such as *'to be more competitive in the global market'*, *'to improve competitiveness'*, and because *'stimulating exports is part of stimulating the macro-economy'*. In many studies no reasons are mentioned at all.

The statements differ greatly in scope and detail, and the distinction between policies adhered to in the past, intended policy directions for the future and actual interventions is often not clear. For example, the China CCA is very general, *'To be more competitive in the global market, China has to invest in more advanced technology'*, while the Egypt CCA includes a more detailed analysis: *'Egypt carries a comparative advantage in some key commodities, which have strong domestic and external demand such as fruits, vegetables, cotton, and (at margin) rice. In most cases Egypt can compete effectively through high and stable yields, cheap water and labour, and exceptional locational advantage'*.

The country studies were screened with respect to statements regarding the relationship between international trade policies and food security or poverty reduction, two issues that are presently under debate. Five country studies mentioned a relationship between international trade and food security: Ethiopia, Mali, Mozambique, South Africa, and Zambia. The statements show that food security is approached from a comprehensive perspective: *'Furthermore, policies which encourage agricultural exports should be thoroughly assessed so as not to undermine food security, because whether or not people are adequately fed is determined by their entitlements to food, not by aggregate food production'* (Ethiopia CCA); *'Addressing this problem [food security] requires an integrated strategy on the part of government, and all sectors of the society, through a package of programmes. A combination of trade policies, the creation of distribution networks, economic growth, job creation, public works programmes, land reform and land use support programmes and investment in agriculture will deal with the problem'* (South Africa CCA); and *'Food, agricultural and overall trade policies must be conducive to fostering food security for all through a fair and market-oriented world trade system'* (Zambia CCA). In none of the country studies are food exports seen as an impediment to attaining food security.

The relationship between international trade policies and poverty was mentioned in 13 of the country studies, generally in a positive sense: *'Future agricultural strategy is therefore based on the premise that export-led growth will spur agricultural production to levels that will bring the poor into the mainstream of economic activity'* (Egypt CCA); and *'Non-traditional export development is seen as one of the critical areas for poverty reduction efforts as well as for growth... The broad strategy is to increase non-traditional exports by reducing transaction costs and increasing the productive capacity of exporters'* (Ghana PRSP).

The country studies thus show a positive attitude towards the possibilities of trade as a means to alleviate poverty. However, neither for poverty alleviation nor for food security is reference made to more detailed studies into the respective relationships with international trade, and the statements in the country studies hardly contribute to the ongoing debate.

3.4 Discussion on international trade

The country studies generally deal with international trade from different angles in different sections. The studies generally do provide some insight into aspects such as export products, trade regulations and policies, but there is rarely any comprehensive coverage. The result is a fragmentary overview of the position of international trade in a country. For either comprehensive or detailed information on international trade additional information is required.

National data on international trade are usually provided by organisations such as the Ministry of Trade, the Central Bank, or the Statistics Office. Worldwide data are provided by the WTO in their 'International Trade Statistics' yearbooks, which include data on trade in merchandise and commercial services for an assessment of world trade

flows by country, region and main product groups or service categories. The Food and Agriculture Organization has a specific focus on agricultural trade with publications on actual trade data and on current trade issues.

A thorough analysis of international trade is essential to determine promising development strategies. While economists generally agree that a move to total free trade can bring substantial welfare gains to the world and a 1 to 2 percentage point increase in growth rate for various developing countries, there are various policy trade-offs and dilemmas that should be taken into consideration before implementing a trade strategy (see e.g. Francois *et al.*, 2003; Beghin and Aksoy, 2003; OECD, 2003).

Developing countries would gain for instance from reduced protection on agricultural OECD markets through the increased market access for their products. The gains of these reforms may however be modest and unequally spread over developing countries. Major gains could for instance be expected from opening beef, grain and dairy markets, which will typically benefit currently exporting countries such as Brazil and Argentina. However, most developing countries export tropical products that are not protected on high-income markets. Notable exceptions are sugar, rice and cotton, which are all protected commodities and for which low-income countries have export positions that could well be expanded after reforms. Moreover, trade policy researchers such as Anderson *et al.* (2001) have repeatedly pointed at the potential gains for developing countries if market access for South-South trade was improved. At the same time, reductions in farm supports and liberalisation of agricultural trade will induce rising prices for food commodities and increase costs of food imports. Also, the exports of various least developed countries may be affected if preferential trade conditions were abolished. Hence, the impact of trade reforms and trade strategy strongly depends on the situation of the country.

4. Biodiversity and Agro-biodiversity

In reviewing the reports on biodiversity and agro-biodiversity, we used the definition proposed by the International Convention on Biological Diversity (CBD): biological diversity means the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part; this includes diversity within species, between species and of ecosystems (CBD, 2003). While this relates to the non-use values of biodiversity, the convention adds broader objectives incorporating a use value to biodiversity. The objectives to be pursued in accordance with its relevant provisions are the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilisation of genetic resources, including appropriate access to genetic resources and appropriate transfer of relevant technologies, taking into account all rights over those resources and technologies, and appropriate funding.

These use functions could be categorised as production functions, processing and regulation functions, carrying functions and other significant functions (Slootweg and Kolhoff, 2003). The non-use functions may relate to social and biophysical interventions in ecosystems that may influence the chance of extinction of cultivars, varieties or populations of species.

Agro-biodiversity can be considered a delineated part of biodiversity, referring to the functional use of biological resources for agricultural purposes. In this context, biological resources comprise crop and animal species that are directly related to productivity, but also life-supporting species, such as worms for maintaining proper soil characteristics and bees for pollination (LNV, 2002).

For a proper assessment of the way in which biological diversity and agro-biodiversity have been considered in the CCA and PRSP documents, the following definitions of the Convention have been considered. 'Biological resources' includes genetic resources, organisms or parts thereof, populations, or any other biotic component of ecosystems with actual or potential use or value for humanity. 'Domesticated or cultivated species' means species whose evolutionary process has been influenced by humans to meet their needs. 'Sustainable use' means the use of components of biological diversity in a way and at a rate that does not lead to long-term decline of biological diversity, thereby maintaining its potential to meet the needs and aspirations of present and future generations.

4.1 Biodiversity

Biodiversity is a meta-concept (Failing and Gregory, 2003) as the CBD definition refers to the 'variety of life' at various levels (genes, species, ecosystems) and various spatial scales (ecosystems, ecological complexes).

4.1.1 Position of biodiversity in country studies

Slightly more than half of the CCA reports and only one PRSP report focus on biodiversity in some detail, explicitly mentioning the word 'biodiversity'. Note however that 88% of the CCA reports and 80% of the PRSPs deal with biodiversity in a broader sense if we consider related issues in our analysis, such as deforestation, overfishing, and natural resource conservation.

4.1.2 Analysis of biodiversity

The decline in biodiversity is analysed in 22 CCA reports and 12 PRSPs. In Table 5 reasons for biodiversity decline are summarised, revealing that demographic pressure, deforestation and a high demand for biomass energy (including fuelwood), and either overfishing or the use of inappropriate fishing methods are most often mentioned.

Table 5. Analysis of biodiversity in the country reports.

Country report	Reasons stated for decline in biodiversity																		
	Poverty	Demographic pressure	Policy, regulation or control	War	Natural disasters incl. fires	Climate change	Pollution	Mining	High demand for biomass energy	Deforestation	Wildlife depletion	Agricultural expansion	Low agricultural productivity	Overgrazing	Inappropriate farming practices	Land degradation or erosion	Overfishing/ bad fishing methods	Habitat destruction	Other*
CCA Bangladesh	0	1	1	0	0	0	1	0	1	1	1	0	0	0	1	1	1	0	1
CCA Benin	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	1	0	1
PRSP Benin	0	1	0	0	1	0	0	0	0	1	0	0	0	1	1	1	1	0	1
CCA Bolivia	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0
PRSP Bolivia	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
CCA Brazil	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1	0	1
CCA Burkina Faso	0	1	0	0	1	1	1	0	0	1	0	0	0	0	1	0	0	0	0
PRSP Burkina Faso	0	0	0	0	0	0	0	0	1	0	0	0	1	1	1	0	0	0	0
CCA China	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
CCA Egypt	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
CCA Eritrea	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
CCA Ethiopia	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1	0	0	1
PRSP Ethiopia	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
CCA Ghana	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PRSP Ghana	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	1
CCA Indonesia	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0
CCA Mali	0	1	1	0	0	1	1	0	1	1	0	0	0	0	1	1	1	0	1
PRSP Mali	0	0	0	0	0	0	0	0	1	0	0	1	1	1	1	1	0	0	0
CCA Mozambique	0	0	0	1	1	0	0	0	0	1	1	1	0	0	0	0	1	0	0
PRSP Mozambique	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
CCA Nicaragua	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
PRSP Nicaragua	0	1	1	0	1	0	0	0	0	1	0	1	0	0	0	0	0	0	0
CCA Rwanda	0	1	0	1	0	0	0	0	0	0	0	1	0	1	1	0	0	0	0
PRSP Rwanda	0	0	0	0	0	0	0	0	1	1	0	0	0	1	0	0	0	0	0
CCA South Africa	0	0	1	0	0	0	1	1	0	1	0	0	0	0	0	0	0	1	1
CCA Sri Lanka	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
CCA Tanzania	0	0	0	0	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0
CCA Uganda	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
CCA Vietnam	0	1	0	1	1	0	1	0	0	1	0	1	0	0	0	0	1	1	0
PRSP Vietnam	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	0	0	1
CCA Yemen	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	1
PRSP Yemen	1	1	0	0	1	1	1	1	1	0	0	0	0	1	0	1	1	0	1
CCA Zambia	0	0	1	0	1	0	0	0	0	1	1	0	0	0	0	0	1	0	0
PRSP Zambia	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Total	4	13	7	4	8	3	8	4	11	17	4	6	3	8	8	7	11	3	15

* The following reasons are mentioned twice: tourism (CCAs of Brazil and Egypt), silting and deterioration of waterways (CCAs of Benin and Mali) and overexploitation of species (CCA of South Africa and PRSP of Bolivia). Any other reason has only been mentioned once.

Linkages between biodiversity and food security in problem analysis

The reports do not directly state that food insecurity results from loss of biodiversity, but nine reports do indicate a relation between food security and natural resources. In all of these reports, this relation concerns the dependence of the (poor) population on natural resources for achieving food security, or the negative effect of human and livestock pressures on natural resources. The PRSP of Zambia characterises the relationship between poverty and environment as a 'vicious circle' or a 'downward spiral' and states that reducing poverty in rural areas is a matter of improving poor people's ability to derive their livelihoods from more productive and sustainable natural resources.

Data on biodiversity

Biodiversity cannot be measured by one single indicator. Only the different facets or dimensions of biodiversity can be determined (Gaston, 1996). Numerous biodiversity-indicators are available. The indicators mentioned in Table 6 are the most frequently used indicators in the country reports. The indicators percentage of forest cover, percentage of protected area, and deforestation rate are all relevant for monitoring the possible loss of ecosystems. The percentage of energy that is derived from biomass describes the potential negative impact that fuelwood can have on biodiversity decline. The number or percentage of species indicates that the reports have paid attention to biodiversity at the species level.

Table 6. Biodiversity indicators mentioned in country reports.

Country	CCAs					PRSP				
	% Forest cover	Deforestation rate	% Protected area	No. or % Species*	% Energy from biomass	% Forest cover	Deforestation rate	% Protected area	No. or % Species*	% Energy from biomass
Argentina	0	0	0	0	0	-	-	-	-	-
Bangladesh	1	0	0	1	1	-	-	-	-	-
Benin	0	0	0	0	0	0	1	0	0	0
Bolivia	1	1	1	1	0	1	0	0	1	0
Brazil	1	1	1	1	1	-	-	-	-	-
Burkina Faso	0	1	0	0	0	0	0	0	0	0
China	0	0	1	1	0	-	-	-	-	-
Egypt	1	1	1	1	0	-	-	-	-	-
Eritrea	1	1	0	0	1	-	-	-	-	-
Ethiopia	1	0	0	0	0	0	0	0	0	1
Ghana	0	1	0	1	0	0	0	0	0	0
India	1	0	0	0	0	-	-	-	-	-
Indonesia	0	0	0	0	0	-	-	-	-	-
Macedonia	-	-	-	-	-	0	0	0	0	0
Mali	1	0	0	0	1	0	0	0	0	1
Mozambique	1	0	0	0	0	0	0	0	0	0
Nicaragua	0	1	1	0	0	0	1	1	0	0
Rwanda	0	1	0	0	1	0	0	0	0	1
South Africa	0	0	1	0	1	-	-	-	-	-
Sri Lanka	1	0	1	0	0	-	-	-	-	-
Tanzania	0	0	0	0	0	0	0	0	0	0
Uganda	1	0	0	0	0	0	0	0	0	0
Vietnam	0	1	0	0	1	0	0	0	0	0
Yemen	0	0	0	0	0	0	0	0	1	0
Zambia	0	1	1	0	0	0	1	1	0	0
Total	11	10	8	6	7	1	2	2	2	3

* The indicator 'no. or % species' is in fact not one indicator. A positive answer means that the report contains one or several indicators that refer to the number of present, endemic, protected or endangered species, sometimes expressed as a percentage of the worldwide number of species.

4.1.3 Policies, strategies and interventions on biodiversity

Table 7 shows that statements on policies, strategies and interventions in the country reports differ greatly in scope and detail. Most CCA reports mention only government policies or statements on what should be done, while some others, such as the CCA of Zambia, mention planned UN activities.

Policy linkages between biodiversity and food security

Three country reports link biodiversity to food security in policy. The CCA of Ghana states that the World Food Programme provides assistance through food aid towards the improvement of the country's forestry resources and game and wildlife reserves. The CCA of Sri Lanka states that measures for soil and biodiversity conservation will be taken as a means to improve the stability of the food supply. In the revised strategy of Ethiopia (PRSP) 'the focus on biological measures as a source of income generation for food insecure households marks a departure from the 1996 strategy'. The PRSP of Zambia shows that some of the environmental programmes that have been established focus on revenue sharing and sustainable livelihoods for the local community.

Policy linkages between biodiversity and poverty

Five PRSPs link biodiversity to poverty in policy statements. The PRSP of Zambia makes the strongest link, as it contains a policy framework in which environmental policies (including policies on biodiversity) are integrated with policies on poverty. The PRSP of Tanzania states that 'future PRSP iterations will capture more fully linkages between environment and poverty reduction, like for example poor people are very dependant on the sale of forest products'. The PRSP of Yemen seeks to 'enhance sustainability of natural resources (...) in addition to making the poor conserve their environment and make the environment serve their livelihoods'. The PRSP of Vietnam states that renewable resources for production by poor people can be ensured by paying attention to biodiversity. The PRSP of Bolivia recognises the potential for biodiversity to be used in favour of the poor rural population.

Four CCA reports show a link between poverty and biodiversity in policy statements. This concerns policy statements on poverty alleviation by focusing on (eco-) tourism in the CCA reports of Zambia and South Africa. The CCA of Rwanda opts for poverty reduction by increasing the access of poor people to natural resources. The CCA of Vietnam states that 'the loss of forest lands needs to be addressed in conjunction with rural development and poverty alleviation activities'.

National biodiversity strategies

Most countries whose reports were reviewed did have a National Biodiversity Strategy as of 1 October 2003. However, only 42% of the CCA reports and 20% of the PRSPs refer to the existence or the development of a National Biodiversity Strategy (Table 8).

Data policies

None of the reports state policies on the collection or generation of data on biodiversity exclusively. However, nine reports do contain policy statements on environmental data in general, as presented in Table 9. In most cases these policies concern the establishment of indicators or the improvement of a national environmental monitoring and data management system.

Table 7. Policies, strategies and interventions on biodiversity mentioned in the country reports.

Country	Policy
CCA Bangladesh	Biodiversity, biomass, deforestation, mangrove ecosystem, coastal and marine water prioritised for attention in the Fifth Five Year Plan.
PRSP Benin	Programme for management of forests and adjacent lands set-up by government with support from the World Bank. Promotion of people's participation in management of forest resources.
PRSP Bolivia	National Biodiversity Strategy will be approved and implemented; many strategies on conservation of biodiversity and wildlife (e.g. consolidation National Protected Areas System), strengthening institutional framework for protection of biodiversity, sustainable utilisation of forest resources (e.g. introduction of non-timber forest activities).
CCA Brazil	Many on-going programmes on conservation of biodiversity and natural resources. Governments will pay attention to the (Cartagena) Protocol on Biosafety and Decision III/11 (on agro-biodiversity).
CCA Burkina Faso	Government has committed itself to three 'green battles', viz. against chasing away animals, abusive forest cutting and forest fires. Environmental priority actions are set in the sectors Forest, Fishery and Fauna and will be executed within the National Program against desertification and the National Plan of action for recovering the environment.
CCA Eritrea	Within the National Economic Framework terrestrial and marine natural resources are conserved and sustainably managed.
PRSP Ethiopia	PRSP states some interventions: establishment of nurseries with indigenous species, more stringent fines for illegal tree felling, planting trees on denuded hills and promotion of alternative sources of energy. Programmes in the resettlement areas should take into account protection of forests, wild animals and water resources.
PRSP Ghana	Threatened ecosystems and habitats of species will be rehabilitated using the Ecosystem Approach.
CCA Indonesia	The UN agencies will indicate ways to protect Indonesia's rich natural resources, including poor community participation.
CCA Mali	Mali should assure a better equivalence between population and natural resources through a rational organisation of the national demography and sustainable management of natural resources. A National Biodiversity Strategy will be developed.
PRSP Mali	The implementation of the CBD as a priority objective to reach control of desertification. Decentralised rural investment projects will be established on (among others) reforestation. 30,000 hectares of designated forests and natural stands will be reclaimed.
PRSP Mozambique	A large number of measures are mentioned to reach the following objectives: active participation of communities and local government in the management of natural resources; improvement and expansion of environmental protection measures; sustainable expansion of forestry and wildlife sector.
CCA Nicaragua	The Strengthened Poverty Reduction Strategy should focus more on biodiversity and be part of the formulation process of the National Biodiversity Strategy and its Action Plan. Strategies for conservation of forests and natural areas are mentioned.
PRSP Nicaragua	A Biodiversity Law and a Biodiversity Strategy are being developed. Market diversification will be encouraged to increase forestry biodiversity and services.
CCA Rwanda	Actors involved in fuelwood conservation and improved stoves will be standardised, consolidated and coordinated; incentives for rehabilitation and management of forests and protected areas will be promoted; successful programmes with villagers (or refugee camp dwellers) involved in environment-friendly actions will be analysed and replicated.
PRSP Rwanda	Reforestation programmes will be established, a forest inventory will be executed and the Forest Law will be updated. Use of improved stoves, solar dryers and water heaters, and kerosene for cooking will be promoted.
CCA South Africa	Requirements for a biodiversity strategy that 'will promote the reconstruction and development of South Africa' are stated.
CCA Tanzania	Traditional biodiversity conservation practices will be promoted; integrated coastal zone management programmes will be implemented; desertification and drought will be monitored; degraded lands will be conserved.
PRSP Uganda	Protection of forests and wetlands need to be funded.
CCA Vietnam	Understanding of the long-term costs of natural resource degradation will be improved through the increased use of cost-benefit analysis.
PRSP Vietnam	The 'improvement and development of national parks and research centres for preservation of precious and rare genetic resources'.
CCA Yemen	Natural endowments should be fully used to accelerate economic growth.
CCA Zambia	The UN will assist Zambia's efforts to fulfil the agreements of the Rio and other related international conferences (including Agenda 21). Urgent measures are needed to ensure sustainable use of forestry products and wildlife.
PRSP Zambia	An extensive policy framework is scheduled for formulation of appropriate policies on the protection of the environment, the management and development of natural resources, and ensuring their efficient and effective delivery and implementation.

Table 8. *National Biodiversity Strategies and references to the strategy in the country reports.*

Country	Existence of National Biodiversity Strategy as of 1 Oct.2003	Reference to Strategy in CCA	Reference to Strategy in PRSP
Argentina	yes	no	-
Bangladesh	no	no	-
Benin	yes	no	no
Bolivia	yes	no	yes
Brazil	yes	yes	-
Burkina Faso	yes	no	no
China	yes	no	-
Egypt	yes	yes	-
Eritrea	yes	no	-
Ethiopia	yes	no	no
Ghana	no	no	no
India	yes	yes	-
Indonesia	yes	no	-
Macedonia	no	-	no
Mali	yes	yes	yes
Mozambique	yes	yes	no
Nicaragua	no	yes	no
Rwanda	yes	yes	no
South Africa	yes	yes	-
Sri Lanka	yes	no	-
Tanzania	yes	no	no
Uganda	yes	no	no
Vietnam	yes	yes	no
Yemen	yes	yes	yes
Zambia	yes	no	No
Proportion 'yes'	84%	42%	20%

Source: CBD, 2003

Table 9. *Policies related to biodiversity data stated in the country reports.*

Country report	Policy statements
Eritrea CCA	Development and implementation of an environmental data collection and distribution policy
Nicaragua CCA	Establishment of a system of objective, verifiable and well-supported indicators
Rwanda CCA	Development of a national system for systematic collection, analysis, storage and dissemination of environmental data
Tanzania CCA	Development of standards and indicators for environmental management and database
Vietnam CCA	Improvement of national environmental monitoring and reporting system
Mali PRSP	Establishment of an efficient information and data management system on the status and evolution of environmental resources
Vietnam PRSP	Improvement of environmental monitoring and disclosure of environmental data and development of the classification of forestry and reform of forest data collection
Yemen PRSP	Development of local and national databases related to poverty and the environment

4.1.4 Discussion on biodiversity

Few reports recognise that biodiversity conservation and poverty reduction are interrelated. Nine reports do link biodiversity and poverty, but only the PRSP of Zambia provides a policy framework in which environmental policies (including policies on biodiversity) are integrated with poverty policies. The PRSP of Tanzania promises to improve linkages between the environment and poverty reduction.

Not many indicators on biodiversity are presented in the country reports. However, there is still no international agreement on how to measure biodiversity. According to Gaston (1996), an all-embracing measure of biodiversity will not be found as the concept of biodiversity cannot be expressed as a single variable, considering the definition of biodiversity as the variability across a range of hierarchical scales, viz. within species, between species and ecosystems. Gaston also concludes that species richness is, wrongly, often put forward as being *the* measure of biodiversity.

Failing and Gregory (2003) argue that policy makers should select a small set of indicators out of the dozens of biodiversity indicators available. This selection should depend on the objectives of biodiversity conservation in a specific situation as biodiversity can be increased in a variety of ways. Moreover, they recommend the weighing of indicators depending on the importance of each single indicator.

4.2 Agro-biodiversity

4.2.1 Reviewing agro-biodiversity

The broad definitions and objectives related to biodiversity and agro-biodiversity as established by the CBD make a solid quantitative assessment of how these issues have been treated in both the CCA and PRSP reports difficult. The broad and open starting-point on agro-biodiversity imposes a wide interpretation of statements in reviewing the reports. As a result, we determined that about three quarter of both country reports include numerous statements regarding agro-biodiversity. This suggests that the issue is relatively well, but implicitly, covered.

Based on the statements found in the reports, a number of important issues can be identified. In Table 10 some summarising statements have been extracted from the general descriptions in the reports that implicitly or explicitly relate to agro-biodiversity.

From Table 10, some broad issues can be deduced that were considered in the country reports. The most prominent statement used in many reports is the observation that only a few crop and animal species are used in the country and that efforts should be made to 'diversify'. Mostly, diversification is seen within an economic context of reducing risk, and ensuring food and income both at the livelihoods level and as a national strategy for development. Diversification is also presented as a coping strategy. Diversification relates to the variety of crops and animals, while no mention is made of diversity within species.

Diversification is sometimes also mentioned in relation to better nutrition. This strategy ultimately stimulates the use of a wider range of our biological resources.

Resource degradation in a broad sense is mentioned in various reports and has been interpreted in this review also as a threat to agro-biodiversity. Various reports indicate that there is a relation between poverty, population pressure, food security and degradation of natural resources. Even conflicts resulting from competition for natural resources are mentioned as a threat to forestry and wildlife conservation.

Table 10. *The context within which agro-biodiversity is mentioned in the country reports.*

Country	Broad context within CCA	Broad context within PRSP
Africa		
Benin	Awareness of lack of diversity in agricultural activities	Call for diversification of agriculture
Burkina Faso	Weak diversification of agricultural production	Poverty associated with inhospitable ecosystem
Eritrea	Introduce package of technology to enhance agricultural productivity; incl. diversification	–
Ethiopia	Degradation, protection of wildlife and forestry mentioned	Improve agricultural productivity; relation between food security and environmental rehabilitation
Ghana	Relation between agricultural activities and environmental degradation	Agricultural diversity to increase productivity
Mali	Diversity through enhancing fruit and vegetable production	Differences in agricultural production systems
Mozambique	Improve agricultural practices and market/institutional conditions	Improved planting material
Rwanda	NO	Negative effects of development on agro-biodiversity
South Africa	NO	–
Tanzania	Introduce package of technology to enhance agricultural productivity	NO
Uganda	Introduce package of technology to enhance agricultural productivity	NO
Zambia	Inadequate crop diversity, including local varieties	Crop diversification
Asia & Pacific		
Bangladesh	Improved seeds; overexploitation of fish resources	–
China	Botanical gardens, breeding and cultivation centres	–
India	NO	–
Indonesia	Mention of a wide range of crops grown	–
Sri Lanka	NO	–
Vietnam	Diversity as a development priority	Diversification of agricultural production
West Asia & North Africa		
Egypt	NO	–
Yemen	Diversity of agricultural production (jeopardised due to qat cultivation)	Enhance agricultural productivity, curtailment of qat cultivation
L. America & Caribbean		
Argentina	NO	–
Brazil	NO	–
Bolivia	Diversity of tree and fishes	NO
Nicaragua	NO	Sustainable environmental management
Europe & CIS		
Macedonia	–	NO

(– = No report; NO = Not statement detected)

Of great importance is the recognition of the impact that the maintenance of biodiversity in general has on climatic conditions. While the changes in climate and variability are generally seen as causes for events such as drought and heat, the Ethiopian report underlines that the opposite is also true: '*... the effect of deforestation has created an unbalanced ecosystem which is manifested in frequent drought and food shortages.*'

Most reports state the need to improve conditions in order to enhance agricultural productivity. These comprise technical conditions such as improved seeds, more and better use of agrochemicals and irrigation. Improvements in institutional conditions are also mentioned, including better access to extension services and credits, properly functioning markets and adequate trade information. While not directly related to agro-biodiversity, these statements do call for the sustainable intensification of agriculture. With enhanced productivity, the expansion of agriculture into natural and fragile lands can be prevented, leaving space for wildlife and forests.

4.2.2 Information use

Chapters

The above issues on agro-biodiversity are discussed in a variety of sections within the reports, including rural development and food security, environment and energy, agriculture employment and livelihoods and cross-cutting issues. No systematic preferences for a particular heading could be found.

Agricultural production systems

As agriculture plays a large role in the economies of the countries reviewed, all of the reports mention agricultural systems that occur in their country. The type of agricultural system can be indicative for the diversity in the agro-sector (e.g. Hammer *et al.*, 2003). Some reports mention the relative importance of agricultural systems, while others only sum up various systems in broad terms such as forestry, livestock, aquaculture, etc. Often case specific crops are mentioned. Hence in elaborating on agricultural systems, no systematic approach could be identified in the reports. In general, Asian countries frequently refer to cereal crops as major contributors, and most African countries stress the role of livestock. Some reports mention differences in farming systems, i.e. subsistence farming, small farms or large commercial farms. Forestry is mentioned in approximately 30% of the reports.

Yield

More than 75% of the reports present some form of yield or production data of their crops and other commodities. About 50% of the CCAs and 33% of the PRSPs specify crops and animals involved in the systems. In virtually all cases data refer to national statistics only. Some reports describe changes in production volume by comparing two or more periods, often a decade apart. It is important to know whether the contribution to the volumetric increase was realised through land expansion or through the increase in land productivity, i.e. through an increase in yield. Land expansion will directly affect the area remaining for other functions such as nature conservation. Yield increase in this regard may be preferred as the indirect effects on nature and biodiversity are less dramatic. The reports do not pay explicit and quantitative attention to this aspect of agricultural production and land use for other purposes.

Different crop varieties

Strikingly, only four reports covering three countries Sri Lanka (CCA), Mozambique (CCA and PRSP) and Ethiopia (PRSP) mention the use of different varieties in agro-activities. The use of a wide range of varieties is perceived to contribute to enhanced agro-biodiversity (Hammer *et al.*, 2003). The use of different varieties is expected to reduce risks, especially under erratic environmental conditions, and to increase the resilience of agricultural systems. The use of different varieties and many crops is especially important for small farmers practicing agriculture for subsistence. Also, the combined cultivation of various varieties of rice on the same field could depress disease infestation (Zhu *et al.*, 2001).

No mention is made by any of the reports of the use of indigenous species for agriculture. Nor is any mention made of a relation between genetic modification and agro-biodiversity. One report mentions an increasing societal resistance to growing genetically modified organisms, while another associates genetic improvement (not specifically referring to GMOs) to enhancing productivity of cattle.

4.2.3 Policies, strategies and interventions

Link with food security

Various CCA and PRSP reports indicate that there is a link between agro-biodiversity and food security. Due to the broad definition of agro-biodiversity, we have compiled these statements in Table 11. The statements reveal that agro-biodiversity is associated with food security primarily through food production and a call for the enhancement of production. Other reports do describe a link between food availability and nature conservation. In addition to the issues in Table 11 extracted from these reports, other reports also place emphasis on food security in close relation to the enhancement of agricultural productivity, but not explicitly in relation to agro-biodiversity.

Table 11. Relations between agro-biodiversity and food security.

Country report	Extracted and condensed statements
Benin CCA	Food insecurity determined by insufficient production and inefficient distribution.
Burkina Faso CCA	Improvement of food security due to improvement of animal races.
Ethiopia CCA	Deforestation, soil degradation and erratic rainfall are largely to blame for food insecurity and poverty. Raising food self-reliance on the basis of accelerated agricultural development.
Ghana CCA	Food aid projects to promote reforestation.
Indonesia CCA	Aim of self-sufficiency in rice achieved in 1985, but production fell short in later years.
Mali PRSP	For rural development, strategy includes diversification and benefiting from forest product opportunities.
Sri Lanka CCA	Stability of food supply and reduced dependence on single crops – diversification.
Tanzania CCA	Poor agricultural production is seen as a constraint to food security.
Vietnam CCA	The success of the rice sector has made a major contribution to the achievement of food security.
Yemen CCA	Agricultural production and the productivity of soils have a direct bearing on ensuring food security.
Zambia CCA	Continuing distortions arising from the misconception that food security is equivalent to availability of adequate quantities of maize and the resulting widespread promotion of maize production, even in unsuitable areas.
Ethiopia PRSP	Multitude of agricultural activities important for food security

Only a few reports, such as those of Ghana and Eritrea, mention the installation of controlling agencies on agro-forestry and desertification supported by various international institutions. Even food aid by the World Food Programme has been associated with the prevention of the overexploitation of forests and land resources for game and wildlife reserves. Vietnam (CCA) and Zambia (PRSP) have documented that special attention in the past was paid to the relations between agriculture and nature, in both cases through programmes instigated by external donors. The dilemmas associated with development and maintenance of biodiversity is explicitly mentioned in the report of Vietnam. The government is taking a leading role in setting out strategies and interventions. These and some other countries mention the continued attention paid to these issues in current policies, most of these supported by external agencies.

No strong relations are presented between agro-biodiversity and poverty reduction. Most reports indicate that the enhancement of agricultural productivity will improve food security and reduce poverty, with no further specification. From some reports (Tanzania, Vietnam), a relation with poverty reduction can be deduced from the call for rural sector development and increased agricultural production.

Not many countries formulate explicit policies on agro-biodiversity. One of the few exceptions is Nicaragua, which suggests that encouraging market diversification will increase forestry biodiversity and services. It envisions a role for agro-ecologies in poverty reduction through a programme on commercial forestry activities and agro-forestry with indigenous communities.

4.2.4 Discussion on agro-biodiversity

Agro-biodiversity is hardly assessed at the lower levels: some country reports do call for crop diversification, but not for diversification of crop varieties. Little emphasis has been placed in the reports on determining what kind of indicators should be used for the quantification of agro-biodiversity in order to trace changes in the past and for future monitoring purposes. Vietnam does call for the development of a classification of forestry data collection. We can state that agro-biodiversity is not well discussed in the PRSP and CCA reports. Almost all interventions and programmes mentioned to maintain agro-biodiversity are initiated by external donors and institutions.

Over the past years various researchers have proposed indicators for quantifying biodiversity. A brief review of some means for quantification and a discussion in the context of this review research are presented below.

Arable weeds can be used as an indicator of biodiversity in agro-ecosystems (Albrecht, 2003). Albrecht shows a strong correlation between the number of weed species and the total species diversity via habitat and food chain relations. Albrecht further indicates that specific management practices, such as fertiliser use, tillage, weed control and measures of crop selection and rotation, all impact agro-biodiversity. No such direct quantitative measures have been presented in the country reports to describe agro-biodiversity.

Most land races have disappeared in European countries over the past century (Hammer *et al.*, 2003). Only 0.2% of the landraces of oats have remained in Finland, and about 90% of the original diversity of landraces in Germany is lost. Traditional landraces continue to exist for crops like fruit trees, medicinal and aromatic plants, local vegetables, grasses and fodder plants. The percentage of landraces remaining in Italy is estimated at 25%. Cuba is identified as an island with a high diversity of crop plants. An impressive 1200 species of crop plants are found, about 17% of the world crop species. Most material is found in gardens with subsistence farming. Interestingly, the high diversity of crop species results from the large number of immigrants from different parts of the world, e.g. from Africa, East Asia, Europe, who introduced their own plant material. Hence, Cuba can be considered as a country with very high biodiversity.

Agricultural practices in a market setting and farm structures in developed nations allow few opportunities for on-farm biodiversity conservation (Hammer *et al.*, 2003). Hammer and colleagues indicate that some typical agricultural products and their genuineness and characteristics, especially in some of the small islands of Italy, can be protected and can receive recognition to increase the income of farmers.

Hammer and colleagues (2003) further note that the biodiversity in agricultural systems in developing countries is much higher, partly due to the lack of technical and chemical means for modernising agriculture. While most country reports call for enhanced diversity of crop and animal species in agriculture, none mention the use of traditional or land races and none have recognised the large agro-biodiversity in their countries. Hence, the call for diversity in the reports is more related to socio-economic and biophysical resilience of agriculture through diversified income sources and food baskets, and reduced risks, which is in line with the presumption that agro-diversification enhances the flexibility and resilience of farming systems to absorb shocks or respond to external opportunities (e.g. Dumanski and Pieri, 2000). Developing countries could instead point to their large agro-biodiversity for better

valuation, in line with the statements made by Hammer and colleagues (2003) on particular areas and products in Europe. So far, richness in agro-biodiversity has not been recognised in the country reports.

Agro-biodiversity needs to be assessed from various perspectives. Below we discuss the dilemmas related to rapid economic development and conservation of biodiversity and agro-biodiversity. In this regard, the spatial dimension needs particular attention.

Huijung *et al.* (2002) describe changes that have occurred in the tropical mountains in southwest China due to rapid developments over the past five decades. Unprecedented rates of change in biodiversity, especially agro-biodiversity, have been seen in the area due to instability of land tenure policies, the replacement of natural forests by state farms, the expansion of community rubber plantations and the transition from central planning to market-driven economic policies. Along with an increasing population, the swidden cultivation is disappearing, which preserved agricultural biodiversity and secondary forests. This process of land use change is seen as inevitably leading to a loss of biodiversity, which cannot be summed up by deforestation or fragmentation; generally the categories of changes in land cover receive the most attention. These dilemmas are noticed by the CCA report of Vietnam. Here strengthening of watershed protection and forest regeneration were sought in barren areas through community-based agro-forestry. At the same time, large-scale facilities for rice cultivation were developed to ensure food availability.

Dumanski and Pieri (2000) suggest that agro-diversity is the degree of diversification of production systems over the landscape and could as such be perceived as the anti-thesis of mono-cropping. These authors refer to the maintenance of diversity at field level. Two dilemmas occur in this regard. First, as Hammer and colleagues (2003) note, that the economic orientation reinforces specialisation and economies of scale for the farmers to remain competitive; developed economies indeed practice mono-cropping and have lost virtually all of their agro-diversity. Hammer *et al.* also indicate that higher levels of diversity can be found in some parts of developed nations, but that these areas need specific valuation to sustain the economic viability of those farms. Secondly, diversity at the field level is not adequate to maintain biodiversity involving large ecosystems, such as forests, coastal zone mangroves and wildlife. To maintain these systems, while still safeguarding food availability, spatial specialisation is required. By allocating some land areas to intensive food production, remaining lands can be used for these large ecosystems (WRR, 1995). Hence, biodiversity should be assessed at various levels, including genetic, species and ecosystem levels, as is indicated by the conceptual framework for scoping biodiversity developed by Sloomweg and Kolhoff (2003).

It remains unclear whether the scarce elaboration on agro-biodiversity in the reports is caused by inadequate attention to this issue in the countries themselves. A brief review indicates that there are means to quantitatively and qualitatively evaluate agro-biodiversity. Developing countries could place a stronger emphasis on their current large agro-biodiversity and call for its maintenance, while simultaneously enhancing development and improving food security. Maintaining a large agro-biodiversity at the farmers' field level may interfere with high yields and the competitive ability of farmers, depressing the value of the so-called use functions of agro-biodiversity. But the non-use functions of agro-biodiversity may also need special care. This path of development, calling for diversified agro-production systems to maintain agro-biodiversity may demand special international agreements on the valuation of both use and non-use functions of agro-biodiversity.

5. Food Safety

Food-borne disease takes a major toll on public health. Thousands of people fall ill and many die as a result of eating unsafe food. The availability of safe food improves the health of people and is a basic human right. Safe food contributes to health and productivity and provides an effective platform for development and poverty alleviation. People are becoming increasingly concerned about the health risks posed by microbial pathogens and potentially hazardous chemicals in food. New challenges to food safety emerge from developments in global food production, processing, distribution and preparation. The integration and consolidation of agricultural and food industries and the globalisation of the food trade are changing the patterns of food production and distribution. These conditions are creating an environment in which both known and new food-borne diseases can become prevalent. Food and feed are distributed over far greater distances than before, creating the conditions necessary for widespread outbreaks of food-borne illness. Also, increasing urbanisation leads to greater requirements for transport, storage and preparation of food. These may lead to situations in which a single source of contamination can have widespread consequences. Hence, protecting food safety should be recognised as an essential public health function.

In this review, reports were screened to determine whether major issues in food safety were incorporated. These major issues comprised (surveillance of) outbreaks of food-borne diseases (mainly through microbiological hazards), contamination of foods through chemical hazards (like natural toxins, environmental contaminants like mercury and lead as well as food additives, pesticides and veterinary drug residues), new technologies (like genetic engineering) and control and inspection of food safety standards.

5.1 Position of food safety in country studies

None of the PRSPs and only 3 CCA reports (Bangladesh, China and Eritrea) elaborate on food safety issues. None of the reports give a definition or description of food safety. However, in 15 reports a discussion of food safety is embedded in another context, mainly as part of the definition of food security (4 reports), as a cause or solution of malnutrition (3 reports), or as part of the right to (safe) food (in 2 reports). If discussed, food safety appears under various chapters in the report, mainly under food security, agriculture or environment, but sometimes under modernisation and industrialisation (Tanzania) or policies and measures for the development of sectors and industries (Vietnam).

5.2 Data collection and analysis

In the context of data collection and analysis, only 5 reports make a link between food safety and food security. In the Bangladesh report, for example, 'food quality and safety' is a sub-section of the chapter on food security and nutrition. In the other reports, food safety is mainly seen as part of the food security definition. Fifteen reports mention factors that positively or negatively influence food safety (Table 12). The following factors are mentioned as causes of low food safety: food contamination (Bangladesh), lack of quality control (Bangladesh, Ghana), air-water-soil pollution (China), water polluters (Egypt, India, Vietnam), low technology of industries (Indonesia), pesticide use (Nicaragua, Rwanda, Sri Lanka, Vietnam), fertiliser use (Rwanda, Sri Lanka), and use of chemicals in agriculture (Tanzania). Only one report (Tanzania) mentions a positive factor contributing to food safety, namely the great concern for and attention paid to safe drinking water in rural and urban areas.

Table 12. *Factors negatively or positively influencing food safety.*

Bangladesh CCA	Food contamination through negligence and malpractice in the food supply. Limited and fragmented national capacity for food quality control. Responsibility for quality control lying with various ministries and agencies that are not effectively co-ordinated.
China CCA	Air-water-soil pollution.
Egypt CCA	Water polluters of the Nile, like pathogens, parasites, heavy metals, fertiliser and pesticide residues, navigational effluents like oil and grease.
India CCA	Pollution of ground and drinking water.
Indonesia CCA	Low technology of the processing industries.
Mozambique CCA	Lack of small and medium-scale agricultural processing infrastructure. Lack of storage facilities resulting in low-quality produce.
Nicaragua CCA	Pesticide use.
Rwanda CCA	Increased pesticide and fertiliser use.
Sri Lanka CCA	Chemical pollution of drinking water supplies from fertiliser, pesticides and industrial effluents.
Tanzania CCA	Polluted, not clean and inadequate water.
Vietnam CCA	Water pollution. Increasing use of pesticides in agriculture.
Zambia CCA	Environmental damage.
Ghana PRSP	Inadequate standardisation and quality control.
Tanzania PRSP	Positive: great concern for and attention to safe water in rural and urban areas.
Vietnam PRSP	Use of toxic substances (chemicals) in agriculture.

Indicators for food safety are used in only five reports (CCAs of Argentina, Bangladesh, Brazil and Egypt and PRSP of Yemen). Five reports mention food contamination, of which three specify the food being contaminated: street foods (Bangladesh), foods irrigated by polluted Nile water (Egypt) and bitter cassava (Mozambique). Only Bangladesh and Egypt indicate that the food contamination occurs in the food supply and distribution system, or in the cultivation of the foods respectively. Two reports mention the outbreak of food-borne diseases, of which only Argentina specifies the outbreak to be related to cholera. Only Brazil mentions the import and export of genetically modified products, indicating that resistance to cultivation of GMOs (like soybeans) exists.

Only three reports mention the control or inspection of food according to food safety standards. The Ghana PRSP states that 'an important weakness of the marketing system in Ghana is the issue of standardisation and quality control'. The Zambia PRSP reports that the legal and regulatory environment has to be improved, and the Bangladesh CCA notes that the national capacity for food quality control is limited and fragmented and that the responsibility for quality control lies with various ministries and agencies that are not effectively co-ordinated. Four reports mention pesticides used in agriculture, but they do not specify which pesticides are used. Only Egypt reports quantitative data on food safety issues as the leading cause of morbidity in hospitals.

5.3 Policy statements, suggested policies, strategies and interventions

In general, food safety issues do not appear in policy statements in any of the reports. However, in 14 reports mention is made of the importance of food safety issues in suggested policies. Mostly these are general statements on the importance of improving the quality of food, the development of safety standards and the need to establish control mechanisms and regulations. None of the reports give further suggestions regarding data collection or analysis on the subject of food safety.

5.4 Discussion on food safety

Food safety receives little attention in most of the country studies. Countries do realise the importance of food safety as it forms a part of the definition of food security, but this is not supported by an analysis of the type and extent of food safety issues present in the country. In most country reports, the suggested policies and strategies are formulated in general terms, such as to improve the quality of food, the development of safety standards and the establishment of control mechanisms. Only the reports from countries confronted with the consequences of for example water pollution, like Egypt, provide a more detailed analysis.

In the reviewed reports, concerns about food safety are mainly related to the domestic situation. Indeed, for a range of reasons, people living in developing countries face a higher level of exposure to contaminated foodstuffs than those living in wealthier countries: the tropical climate favours proliferation of pests and naturally occurring toxins, the water supplies used to clean and process food are frequently unsafe, and regulatory standards are either low or not as well enforced (Hanak *et al.*, 2000). Rapid urbanisation may complicate the situation, by changing people's traditional ways of handling their food: more and more people depend on markets, and many rely at least in part on food prepared outside of the home.

Hardly voiced in the reviewed reports, but definitely not less important, are the growing concerns about food safety internationally, impacting on the trade-oriented sectors of developing countries. The new focus on food safety issues in international trade brought food safety to the forefront of debates concerning trade in food and agricultural products in the Uruguay Round of international trade talks, leading to the enactment of the Sanitary and Phytosanitary Standards. In the context of diminishing tariffs and quota, the current rules imposed by these standards may create novel barriers for trade with developed nations. Due to a tightening of standards in the North in response to increasing consumer concerns about food safety, access to international markets will be more restricted affecting export of food commodities by developing countries. Otsuki *et al.* (2001) for instance shows that stricter EU standards of aflatoxin compared to those set by the international standard of the Codex Alimentarius Commission will reduce the health risk by approximately 1.4 deaths per billion a year, while decreasing exports from Africa by US\$ 670 million.

Hanak *et al.* (2002) indicate that governments can play a critical role in promoting food safety by helping producers and processors make the transition to meeting new international standards through implementing institutional structures and procedures. Further, if consumers are to be able to play a more effective role in protecting themselves from food-borne diseases, health education is essential, and governments may support the development of new consumer groups to address this need. Public-private collaboration is needed for research on risk assessment and quality assurance activities. Also, in defining standards, Henson and Loader (2001) argue that more effective participation of developing countries is needed, while developed countries should take the special circumstances of developing countries into account.

Being an instrument of public health as well as a tool for economic development, food safety should receive ample attention so that both the domestic and the external challenges facing developing countries can be met. Food safety depends on identifying and analysing hazards, setting and enforcing achievable food standards and developing plans to monitor the adherence to these standards.

6. Discussion and conclusions

This review of the four issues agro-biodiversity, biodiversity, international trade and food safety reveals that all four are mentioned in one way or another in the majority of the country studies. However, they have been dealt with haphazardly and in a non-coherent manner.

Ample attention is paid to international trade in the country reports, though the attention differs between countries in focus and in detail. Most reports mention the improvement of their national competitiveness on the increasingly liberalised international markets. Various countries discuss some vagaries of international trade. Most reports relate trade to food security through the import of food. Though most countries are members of regional trade organisations, little emphasis is placed on these trade options. The importance of agriculture in trade is recognised, but quantitative information is not given. In general, the country reports do reveal a positive view towards the possibilities of trade as a means to alleviate poverty and food insecurity, but no reference is made to more detailed studies.

Biodiversity and agro-diversity are relatively new concepts which are broadly defined. They cover issues related to the non-use and use functions of plants and animal in all spheres on earth. Providing comprehensive descriptions of these issues in country papers is a daunting challenge. On the other hand, the discussions on these issues have evolved in the international arena and provide some guidance as to how to address most of their major aspects. Unfortunately, none of the country reports systematically consider these insights nor do they adjusted their descriptions accordingly. Much improvement can be obtained if well-informed teams draft the reports.

Food safety is an important element of the global trade of agricultural food items. Safe food is also a prerequisite for a healthy life and for preventing food-borne diseases. Few reports address these issues directly, but an awareness of their importance can be deduced from various though sporadic qualitative remarks. No quantitative information is provided, and the qualitative remarks concern food safety related to contamination, drinking water, lack of quality control, etc. No report specifically relates food safety issues to international trade.

None of the CCAs or PRSPs have a specific section which provides an overview of all policies and their priorities. Therefore, some statements, like establishment of reforestation programmes, execution of a forest inventory and updating the Forest Law' and 'to be more competitive in the global market, China has to invest in more advanced technology' leave the reader with questions regarding the actual priority of the respective issues. This lack of insight remains when an issue is traced throughout a country study as the statements are fragmentary in nearly all cases, and thereby insufficient for a clear perspective on the actual position of the country. The conclusion therefore is that neither the CCAs nor the PRSPs offer sufficient insight for a realistic perspective on the country's position regarding the four issues. More specialized reports and studies have to be reviewed for a satisfactory overview of the issues in selected countries. Also, the teams involved in drafting the report may need increased awareness and knowledge of the insights that are being developed internationally on these issues. Hence, concerted international action is required to strengthen the national and international links on policy agreements and interventions in country strategy papers.

References

- Albrecht, H., 2003.
Suitability of arable weeds as indicator organisms to evaluate species conservation effects of management in agricultural ecosystems. *Agriculture, Ecosystems & Environment* 98: 201-211.
- Anderson, K., B. Dimaran, J. Francois, T. Hertel, B. Hoekman & W. Martin, 2001.
The costs of rich (and poor) country protection to developing countries, CIES discussion paper, Adelaide.
- Beghin, J. & A. Aksoy, 2003.
Agricultural Trade and the Doha Round: Lessons from Commodity Studies, CARD Briefing Paper 03-BP 42.
- Bindraban, P.S., H.L. Aalbers, H.A.J. Moll, I.D. Brouwer, M. van Dorp, C.B. Houtman, M.L. Brouwer, M.M.M. Zuurbier & E.C.M. Hagenaaars, 2003.
Focus on food security. A review of the UN System Common Country Assessments and World Bank Poverty Reduction Strategy Papers. Food and Agricultural Organization (FAO) and Wageningen University and Research Centre (Wageningen UR). Rome, Italy. <http://www.fao.org/DOCREP/006/Y5095E/Y5095E00.HTM>
- CBD [Convention on Biological Diversity], 2003.
<http://www.biodiv.org/> (Accessed October 2003).
- CCA [Common Country Assessment], 1999.
Guidelines. United Nations Development Group Office.
- Dumanski J. & C. Pieri, 2000.
Land quality indicators: research plan. *Agriculture, Ecosystems & Environment* 81: 93-102.
- Failing, L. & R. Gregory, 2003.
Ten common mistakes in designing biodiversity indicators for forest policy. *Journal of Environmental Management* 68: 121-132.
- FAO. 1996.
Rome Declaration, in the World food Security and World Food Summit Plan of Action. (see http://www.fao.org/wfs/index_en.htm)
- FAO. 2002.
Report of the World Food Summit: five years later. Rome, 10-13 June 2002. Part One. (see: <http://www.fao.org/worldfoodsummit/english/documents.htm>)
- Francois, J., H. van Meijl & F. van Tongeren, 2003.
Economic Benefits of the Doha Round for The Netherlands, The Hague: LEI.
- Gaston, K.J., 1996.
What is biodiversity? In: Gaston, K.J. (ed.), 1996. *Biodiversity. A biology of numbers and differences*: 1-12. Blackwell Science, Oxford.
- Hammer, K., Th. Gladis & A. Diederichsen, 2003.
In situ and on-farm management of plant genetic resources. *European Journal of Agronomy* 19: 509-517.
- Hanak, E., P. Boutrif and M. Pineiro (eds.)
Food safety management in Developing countries. Proceedings of the International Workshop, CIRAD-FAO, 11-13 December 2000, Montpellier, France. CIRAD-FAO, Montpellier, 2002.
- Henson, S. & R. Loader, 2001.
Barriers to agricultural exports from developing countries: the role of sanitary and phytosanitary requirements. *World Development* 29: 85-102.
- Huijun, G., C. Padoch, K. Coffey, C. Aiguo & F. Yongneng, 2002.
Economic development, land use and biodiversity change in the tropical mountains of Xishuangbanna, Yunnan, Southwest China. *Environmental Science & Policy* 5: 471-479.
- Koning, N.B.J., Bindraban, P.S. & Essers, A.J.A. (eds). 2002.
Wageningen views on food security. Wageningen Platform for Food Security. Wageningen, May 2002. 42 pp.
- LNV, 2002.
Bronnen van ons Bestaan. Policy paper of Netherlands Ministry of Agriculture, Nature management and Food safety. April 2002. The Hague, The Netherlands.

- OECD [Organisation for Economic Co-operation and Development], 2003.
Agricultural Trade and Poverty: Making Policy Analysis Count, Paris.
- Otsuki, T., Wilson J.S. & M. Sewadeh
Saving two in a billion: quantifying the trade effect of European food safety standards on African exports. Food Policy 26: 495-514.
- Prebisch, R., 1984.
Five stages in my thinking on development. In: Meier G.M. and D. Seers (eds.), 1984. Pioneers in development. New York, Oxford University Press.
- Slootweg, R. & A. Kolhoff, 2003.
A generic approach to integrate biodiversity considerations in screening and scoping for EIA. Environmental Impact Assessment Review 23: 657-681.
- Stiglitz, J.E., 1996.
Some lessons from the East Asian miracle. World Bank Research Observer 11: 151-177.
- UN [United Nations]. 2003.
Common Country Assessment (CCA) and UN Development Assistance Framework (UNDAF). UN Resident Coordinator System Network. UN Development Group Office (UNDGO). (see: www.dgo.org)
- World Bank. 2003.
Poverty reduction strategies and PRSPs. (see: <http://www.worldbank.org/poverty/strategies>)
- WRR, 1995.
Sustained risk: a lasting phenomenon. Reports to the Government 44. Netherlands Scientific Council for Government Policy. The Netherlands.
- WTO, 2004.
International trade statistics 2003. (http://www.wto.org/english/res_e/statis_e/its2003_e/its03_toc_e.htm)
- Zhu, Y.Y., H.R. Chen, Y.Y. Wang, Z.S. Li, Y. Li, J.H. Fan, J.B. Chen, J.X. Fan, S.S. Yang, G.L. Ma, L.P. Hu, J.Y. Zou & L. Hei, 2001.
Diversifying variety for the control of rice blast in China. Biodiversity 2: 10-14.

Appendix I.

Questionnaire for (Agro-)Biodiversity, Trade and Food Safety

No.	Heading/ Question	Possible answers *
Identification		
1	Research assistant	1= HA; 2 = AB; 3 = VG
2	Date end of review	ddmmyy
3	Hours needed for review	
4	Language of report	1 = English; 2 = French; 3 = Spanish; 4 = other
4a	If other language, specify	
5	Pages in report (excluding annexes)	
6	Name of country	
7	Region	1 = Africa; 2 = Asia; 3 = Arabic states; 4 = Europe; 5 = Latin America
8	Country number	
9	CCA or PRSP	1= CCA; 2 = PRSP; 3 = IPRSP
10	Is it a 'Least Developed Country' (LDC)?	0 = no; 1 = yes
11	Population size in millions (1997-1999)	
12	Size of country in thousands of square kilometres	
General		
13	What is the organisation structure of the CCA or PRSP?	1 = Thematic; 2 = systematic; 3 = thematic structure with systematic substructure; 4 = systematic structure with thematic substructure; 5 = other
13a	If answer is other, describe organisation structure	
14	Does the CCA or PRSP put emphasis on assessment or policy?	1 = assessment; 2 = policy; 3 = equal
15	Does the CCA or PRSP provide a definition of food security?	0 = no; 1 = yes
15a	If yes, describe the definition of food security	
16	Is the quality of the infrastructure in the country described?	0 = no; 1 = yes
16a	If yes, describe the quality of the infrastructure in the country	
17	Is something mentioned about data availability?	0 = no; 1 = yes
17a	If yes, what is mentioned?	

Agro-Biodiversity/ Biodiversity		
Definition		
18	Does the CCA or PRSP elaborate on biodiversity?	0 = no; 1 = yes
19	Is the concept biodiversity defined in the CCA or PRSP?	0 = no; 1 = yes
19a	If yes, give the definition of the concept biodiversity	
20	Does the report use the word biodiversity or biological diversity?	0 = no; 1 = yes
21	If no definition is given, is biodiversity discussed in another context?	0 = no; 1 = yes
21A	If yes, how is biodiversity discussed?	
22	Under which chapter(s) and subsection(s) is (the concept of) biodiversity discussed?	
23	Does the CCA or PRSP elaborate on agro-biodiversity?	0 = no; 1 = yes
24	Is the concept agro-biodiversity defined in the CCA or PRSP?	0 = no; 1 = yes
24A	If yes, give the definition of the concept agro-biodiversity	
25	If no definition is given, is agro-biodiversity discussed in another context?	0 = no; 1 = yes
25A	If yes, how is agro-biodiversity discussed?	
26	Under which chapter(s) and subsection(s) is (the concept of) agro-biodiversity discussed?	
Data collection and analysis		
27	Is a link made between biodiversity and food security in the context of data collection and analysis?	0 = no; 1 = yes
27A	If yes, describe the link	
28	Does the report mention developments / factors influencing biodiversity positively or negatively?	0 = no; 1 = yes
28A	If yes, describe the developments / factors	
29	Is a link made between agro-biodiversity and food security in the context of data collection and analysis?	0 = no; 1 = yes
29A	If yes, describe the link	
30	Does the report mention developments / factors influencing agro-biodiversity positively or negatively?	0 = no; 1 = yes
30A	If yes, describe the developments / factors	
<i>Biodiversity indicators</i>		
31	Does the CCA or PRSP make use of indicators for describing biodiversity?	0 = no; 1 = yes
31a	If yes, what indicators does it use to describe biodiversity?	
32	Is the proportion of land area covered by forest mentioned?	0 = no; 1 = yes
32a	If yes, what is the proportion?	
33	Is the ratio between protected area (to maintain biological diversity) and surface area mentioned?	0 = no; 1 = yes

33a	If yes, what is the ratio?	
34	Is the percentage of energy derived from biomass sources mentioned?	0 = no; 1 = yes
34a	If yes, what is the percentage?	
35	Is a ratio or coverage percentage between/ for arable land and natural vegetation mentioned?	0 = no; 1 = yes
35a	If yes, what is the ratio or coverage percentage for arable land/ natural vegetation	
36	Is rate of species loss mentioned?	0 = no; 1 = yes
36a	If yes, what is the rate of species loss?	
37	Are land and marine degradation mentioned?	0 = no; 1 = yes
37a	If yes, describe how land and marine degradation are mentioned	
38	Is something mentioned about indigenous natural species being threatened by alien species or by genetically modified organisms?	0 = no; 1 = yes
38a	If yes, which species are threatened and which species are threatening?	
39	Is local existing knowledge about diversity mentioned?	0 = no; 1 = yes
39a	If yes, describe the existing local knowledge about diversity	
40	Are any other quantitative data on biodiversity presented in the CCA or PRSP?	0 = no; 1 = yes
40a	If yes, specify data presentation, topic, etc.	
	<i>Agro-biodiversity indicators</i>	
41	Does the CCA or PRSP make use of indicators for describing agro-biodiversity?	0 = no; 1 = yes
41a	If yes, what indicators does it use?	
42	Are the main agricultural production systems mentioned?	0 = no; 1 = yes
42a	If yes, describe the main agricultural production systems	
43	Are the yields for the different main agricultural products given?	0 = no; 1 = yes
43a	If yes, what are the yields of the different main agricultural products	
44	Does the report mention specific crops, farm animals or fish?	0 = no; 1 = yes
44a	If yes specify crops, farm animals or fish	
45	Are different crop varieties, grown for consumption, mentioned?	0 = no; 1 = yes
45a	If yes, how many varieties are grown for consumption?	
45b	If yes, specify the different crop varieties	
46	Are different crop varieties, grown for export, mentioned?	0 = no; 1 = yes
46a	If yes, how many different crop varieties are grown for export?	
46b	If yes, specify the different crop varieties	
47	Are different breeds of reared farm animals mentioned?	0 = no; 1 = yes
47a	If yes, give number of the different breeds	
47b	If yes, specify the different breeds	

48	Is something mentioned about indigenous agricultural species being threatened by alien species or by genetically modified organisms?	0 = no; 1 = yes
48a	If yes, which species are threatened and which species are threatening?	
49	Are any other quantitative data on agro-biodiversity presented in the CCA or PRSP?	0 = no; 1 = yes
49a	If yes, specify data presentation, topic, etc.	
	Policy statements	
50	Is a link made between biodiversity and food security in formulated policies?	0 = no; 1 = yes
50a	If yes, describe the link	
51	Are previous policies for biodiversity discussed?	0 = no; 1 = yes
51a	If yes, describe the previous policies	
52	Are ongoing policies for biodiversity discussed?	0 = no; 1 = yes
52a	If yes, describe the ongoing policies	
53	Is a link made between agro-biodiversity and food security in formulated policies?	0 = no; 1 = yes
53a	If yes, describe the link	
54	Are previous policies for agro-biodiversity discussed?	0 = no; 1 = yes
54a	If yes, describe the previous policies	
55	Are ongoing policies for agro-biodiversity discussed?	0 = no; 1 = yes
55a	If yes, describe the ongoing policies	
	Suggested policies, strategies and interventions	
56	Is a link made between biodiversity and food security in the context of suggested policies, strategies or interventions?	0 = no; 1 = yes
56a	If yes, describe the link	
57	Is a link made between biodiversity and poverty reduction in the context of suggested policies, strategies or interventions?	0 = no; 1 = yes
57a	If yes, describe the link	
58	Are policies, strategies or interventions suggested regarding biodiversity?	0 = no; 1 = yes
58a	If yes, describe these policies, strategies or interventions	
59	Is a National Biodiversity Strategy mentioned on the website of the Convention of Biological Diversity?	0 = no; 1 = yes
59a	Is a National Biodiversity Strategy mentioned in the CCA or PRSP?	0 = no; 1 = yes
60	Are suggestions made regarding data-collection or -analysis on the subject of biodiversity?	0 = no; 1 = yes
60a	If yes, what is suggested?	

61	Is a link made between agro-biodiversity and food security in the context of suggested policies, strategies or interventions?	0 = no; 1 = yes
61a	If yes, describe the link	
62	Is a link made between agro-biodiversity and poverty reduction in the context of suggested policies, strategies or interventions?	0 = no; 1 = yes
62a	If yes, describe the link	
63	Are policies, strategies or interventions suggested regarding agro-biodiversity?	0 = no; 1 = yes
63a	If yes, describe these policies, strategies or interventions	
64	Are suggestions made regarding data-collection or -analysis on the subject of agro-biodiversity?	0 = no; 1 = yes
64a	If yes, what is suggested?	
	Trade	
	Definition	
65	Does the CCA or PRSP elaborate on international trade?	0 = no; 1 = yes
66	Is the concept international trade defined in the CCA or PRSP?	0 = no; 1 = yes
66a	If yes, give the definition of the concept international trade	
67	If no definition is given, is international trade discussed in another context?	0 = no; 1 = yes
67a	If yes, how is international trade discussed?	
68	Under which chapter(s) and subsection(s) is (the concept of) international trade discussed?	
	Data collection and analysis	
69	Is a link made between international trade and food security in the context of data collection and analysis?	0 = no; 1 = yes
69a	If yes, describe the link	
70	Are problems related to international trade discussed?	0 = no; 1 = yes
70a	If yes, describe the problems related to international trade	
71	Is liberalisation of international trade discussed?	0 = no; 1 = yes
71a	If yes, how is liberalisation of international trade discussed?	
72	Is regional integration discussed?	0 = no; 1 = yes
72a	If yes, how is regional integration discussed?	
	<i>International trade indicators</i>	
73	Does the CCA or PRSP make use of indicators for describing international trade?	0 = no; 1 = yes
73a	If yes, what indicators are used to describe international trade?	
74	Is something mentioned about food products involved in import or export?	0 = no; 1 = yes
74a	If yes, describe the food products involved	
75	Are import tariffs or export levies mentioned?	0 = no; 1 = yes
75a	If yes, describe the tariffs and/ or levies	

76	Is a trade balance mentioned?	0 = no; 1 = deficit; 2 = surplus
77	How are data presented with reference to a trade balance?	0 = no; 1 = single year; 2 = multiple years
78	Is a food balance mentioned?	0 = no; 1 = deficit; 2 = surplus
79	How are data presented with reference to a food balance?	0 = no; 1 = single year; 2 = multiple years
80	Are any other quantitative data on trade presented in the CCA or PRSP?	0 = no; 1 = yes
80a	If yes, specify data presentation, topic, etc.	
	Policy statements	
81	Is a link made between international trade and food security in formulated policies?	0 = no; 1 = yes
81a	If yes, describe the link	
82	Are previous policies for international trade discussed?	0 = no; 1 = yes
82a	If yes, describe the previous policies	
83	Are ongoing policies for international trade discussed?	0 = no; 1 = yes
83a	If yes, describe the ongoing policies	
	Suggested policies, strategies and interventions	
84	Is a link made between international trade and food security in the context of suggested policies, strategies or interventions?	0 = no; 1 = yes
84a	If yes, describe the link	
85	Is a link made between international trade and poverty reduction in the context of suggested policies, strategies or interventions?	0 = no; 1 = yes
85a	If yes, describe the link	
86	Are policies, strategies or interventions suggested regarding international trade?	0 = no; 1 = yes
86a	If yes, describe these policies, strategies or interventions	
87	Are suggestions made regarding data-collection or -analysis on the subject of international trade?	0 = no; 1 = yes
87a	If yes, what is suggested?	
	Food safety	
	Definition	
88	Does the CCA or PRSP elaborate on food safety?	0 = no; 1 = yes
89	Is the concept food safety defined in the CCA or PRSP?	0 = no; 1 = yes
89a	If yes, give the definition of the concept food safety	
90	If no definition is given, is food safety discussed in another context?	0 = no; 1 = yes
90a	If yes, how is food safety discussed?	
91	Under which chapter(s) and subsection(s) is (the concept of) food safety discussed?	

Data collection and analysis		
92	Is a link made between food safety and food security in the context of data collection and analysis?	0 = no; 1 = yes
92a	If yes, describe the link	
93	Does the report mention developments / factors influencing food safety positively or negatively?	0 = no; 1 = yes
93a	If yes, describe the developments / factors	
	<i>Food safety indicators</i>	
94	Does the CCA or PRSP make use of indicators for describing food safety?	0 = no; 1 = yes
94a	If yes, mention indicators describing food safety	
95	Does the CCA or PRSP mention anything about food contamination?	0 = no; 1 = yes
95a	If yes, which food product is involved?	
95b	If yes, In which part of the food chain did food contamination occur?	
96	Are outbreaks of food-borne disease reported?	0 = no; 1 = yes
96a	If yes, specify foodborne disease and cause of outbreak?	
97	Is something mentioned about import or export of genetically modified food?	0 = no; 1 = imported; 2 = exported; 3 = both
97a	If yes, specify GMO food products	
98	Is something mentioned about control or inspection on food safety standards?	0 = no; 1 = yes
98a	If yes, specify used standard and involved authorities	
99	Are pesticides used in agriculture specified?	0 = no; 1 = yes
99a	If yes, specify pesticides	
100	Is any quantitative data on food safety issues presented in the CCA or PRSP?	0 = no; 1 = yes
100a	If yes, specify data presentation, topic etc.	
Policy statements		
101	Is a link made between food safety and food security in formulated policies?	0 = no; 1 = yes
101a	If yes, describe link	
102	Are previous policies for food safety discussed?	0 = no; 1 = yes
102a	If yes, describe previous policies	
103	Are ongoing policies for food safety discussed?	0 = no; 1 = yes
103a	If yes, describe ongoing policies	

	Suggested policies, strategies and interventions	
104	Is a link made between food safety and food security in the context of suggested policies, strategies or interventions?	0 = no; 1 = yes
104a	If yes, describe link	
105	Is a link made between food safety and poverty reduction in the context of suggested policies, strategies or interventions?	0 = no; 1 = yes
105a	If yes, describe link	
106	Are policies, strategies or interventions suggested regarding food safety?	0 = no; 1 = yes
106a	If yes, describe these policies, strategies or interventions	
106b	If yes, which actors are involved in prevention strategies or food safety management?	
107	Are control and inspection on food safety standards goal issues of future policies?	0 = no; 1 = yes
108	Are suggestions made regarding data-collection or -analysis on the subject of food safety?	0 = no; 1 = yes
108a	If yes, what is suggested?	

* Additional answers: -9 = not applicable; x = unknown

Appendix II.

Keywords for reviewing the country reports

Infrastructure (general section only)

Infrastructure – transport - way – route – street –road

International Trade

Trade – import – export – market – tariff – surplus – deficit – balance – liberalisation – integration - free trade – commerce – international – regional – (foreign) exchange market - food product - harvest – price – competitive - imperfect market – term – food aid – value price – levy/ levies – barriers – tax – ban – boycott – Comesa – SADC – ECOWAS – UNCTAD – WTO

Biodiversity

Bio – natural resources – environment – ecosystem – species – varieties – wildlife – game – bird life – habitat –fauna – animal – heavy fishing – micro-organisms – botanic – flora – plant - vegetation – wetlands/ drylands - marine – forest – logging– woodlots – plantation – firewood – charcoal – erosion – degradation - expansion – endanger – extinction – endemic – exotic/ foreign – loss – conservation – protect – reserve – park – pollution – contaminate – sustainable

Agro-biodiversity

Agro – Agri – crop – cultivar – cultivated – genetic – vegetable – fruit – yield – livestock – rear – herding - breed – (land) race - cattle – seed – fertiliser – pesticide – pest – parasite – competitor – grow - biomass – source – energy local knowledge/ know how
Production systems: crop farming - (agro-) forestry - Sylvie culture – horticulture - dairy farming - livestock (herding)

Food safety

Quality – standard – label – grade – code – Sanitary and PhytoSanitary measures (SPS) – control – inspection – toxicity – poison – venom – inedible – safe – pesticide – residue – pollution – genetic – hazard – hygiene – sanitary – contaminate – decay/ putrefy/ rot/ taint – mold/ mould – fungus – consume – intake – clean – exposure – outbreak – foodborne – Cholera – Salmonella/ Salmonellosis – Coli – Campylobacteriosis – intestinal – parasite – bacteria – virus – chemical – biological – pathogen – agent – disease – infection – transmission – illness – street-vended – food chain – food processing

Appendix III.

Numeric answers to the questions

This appendix provides information on whether a subject has been dealt with or not. The statements that have been extracted whenever information is provided are not shown.

Appendix III D Food safety

No.	Heading/ Question	Argentina CCA	Bangladesh	Benin CCA	Bolivia CCA	Brazil CCA	Burkina Faso	China CCA	Egypt CCA	Eritrea CCA	Ethiopia CCA	Ghana CCA	India CCA	Indonesia CCA	Mali CCA	Mozambique CCA	Nicaragua CCA	Rwanda CCA	South Africa	Sri Lanka CCA	Tanzania CCA	Uganda CCA	Vietnam CCA	Yemen CCA	Zambia CCA	
	0 = No; 1 = Yes; -8 = Unknown; -9 = Not relevant																									
	Food safety																									
	Definition																									
88	Does the CCA or PRSP elaborate on food safety?	0	1	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
89	Is the concept food safety defined in the CCA or PRSP?	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
90	If no definition is given, is food safety discussed in another context?	0	1	0	0	0	0	1	1	0	1	1	0	0	0	1	1	0	1	0	1	0	0	1	0	
	Data collection and analysis																									
92	Is a link made between food safety and food security in the context of data collection and analysis?	0	1	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
93	Does the report mention developments / factors influencing food safety positively or negatively?	0	1	0	0	0	0	1	1	0	-9	0	1	1	0	1	1	1	0	1	0	1	0	0	0	
	Food safety indicators																									
94	Does the CCA or PRSP make use of indicators for describing food safety?	1	1	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
95	Does the CCA or PRSP mention anything about food contamination?	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	
96	Are outbreaks of food-borne diseases reported?	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
97	Is something mentioned about the import or export of genetically modified food?	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
98	Is something mentioned about control or inspection based on food safety standards?	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
99	Are pesticides used in agriculture specified?	1	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	
100	Are any quantitative data on food safety issues presented in the CCA or PRSP?	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

