Caritas Internationalis

What climate change means for feeding the planet

A Caritas Internationalis reflection paper

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Executive Summary

What climate change means for feeding the planet brings together the concerns of Caritas organisations confronted with the effects of climate change on the livelihoods of smallholder farmers.

In its strategic framework for 2011 to 2015, *One Human Family, Zero Poverty*, Caritas Internationalis pledged to advocate on behalf of poor people on the connection between climate change and food security.

The aim of this paper is to help Caritas as a whole to better understand that connection, learn about Caritas experiences worldwide and use them as models for new action. Based on these reflections, the paper also proposes key messages for Caritas' national and global advocacy.

Caritas organisations around the world witness the effects of an unsustainable climate, primarily understood as adverse climatic conditions induced by climate change. This unsustainable climate is also created by inadequate policies on agriculture, land tenure, governance, development, global trade, domestic market and industry. These policies have failed to guarantee the rights of smallholder farmers who are often among the poorest and most vulnerable people, yet also the backbone of our food systems.

The climate justice advocated by Caritas must find its policy answers in an effective and participative strategy of sustainability at a global scale.

This paper does not seek to address all general problems affecting food security (such as food loss and waste or progressive urbanisation). The topics it does address are core issues that come from the people the Caritas confederation serve and those which the Caritas organisations address. The topics correspond to the Caritas organisations' competence and the expertise the network has developed in response to the challenges of climate change. Other problems will be analysed in dedicated, separate policy briefings.

This paper is divided into two sections. *Understanding today's challenges* underlines the importance of food security and climate change for Caritas organisations. It provides a theological reading of food, a definition of key terms and explains the connections between climate change and food security, placing current and future debates in the context of sustainable development. This is a follow-up to the Caritas Internationalis paper "Climate Justice – Seeking a Global Ethic".

Structural issues affecting the link between food security-climate change examines the issues, connected with climate change, that threaten poor people's right to food, and which demand attention from the international community as well as Caritas.

Agro-fuels, once considered an effective way of reducing greenhouse gas emissions and fossil fuel dependency, and an effective means of income generation in developing countries, have put the world's agriculture under unsustainable pressure. Using arable land to grow crops for fuel means there is less for growing food, which in turn pushes food prices out of the reach of poor people. It's often local, indigenous communities who are pushed off their land to make way for agro-fuel crops, and who may not even be compensated because of inadequate laws on land tenure. By supporting pro-agro-fuel policies, developed countries have created new business opportunities for agro-industries, with accompanying speculation and further marginalisation of small-scale farmers. Agro-fuels have had a negative effect on the environment: they need strong chemicals that increase nitrogen-based greenhouse gases, contaminate water, damage soil quality and reduce biodiversity.

The agro-business model is not to be promoted if we want to foster environmentally and socially sustainable food production and climate justice in general. This paper argues that we should gradually abandon large-scale agro-fuel production as a way of meeting the world's energy needs.

Taking the recent policy changes in the European Union (EU) as an example, this paper suggests moving instead to a local, small-scale model of production which would be more sustainable and better serve the long-term goals of ensuring food security, control over land and other resources, improvement of livelihoods and energy self-sufficiency for local farming communities.

This paper explores a second key element for food security: land. It is a central part of Creation which belongs to God; land was gratuitously given to mankind to nourish and protect. Yet, the world's demand for land, water and other primary resources has become the cause of injustice in developing countries. Smallholder farmers cannot make a living because they are denied access to land and other resources, or their rights to land are not upheld by the law. For poor farmers, having no land means being powerless and deprived of dignity.

This paper looks at the need for stronger governance of land, at national and local levels, to secure land tenure and protect the livelihood of smallholder farmers. The example of a just agrarian reform in South Africa, advocated by the Southern African Catholic Bishops' Conference, offers inspiring guidance for Caritas advocacy on land tenure.

Land grabbing is a phenomenon where land is taken away from local farmers for the benefit of big business investors. Extractive industries bear a large share of responsibility.

They take away farmers' means of making a living, causing poverty and even forcing them to leave their homes. Extractive industries also cause ecological damage and accelerate climate change.

In the face of global warming, sound water management is more essential than ever for food security, as demonstrated by the recent food crisis in the Sahel region, witnessed by OCADES (Caritas Burkina Faso). Based on these examples, the Caritas confederation is called to engage in advocacy and intervention at national and local levels so that the recent UN's Food and Agriculture Organisation (FAO) *Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security* are implemented, and so that sound Principles on Responsible Agricultural Investment are adopted at the FAO.

Climate change, and in particular extreme weather events, can also cause increased volatility in staple food prices. This paper examines how the global food trade is influenced by climate change, already evident in lower yields and crop losses. When crops are scarce (for example because of drought) food prices rise beyond the reach of the poorest. This is particularly worrying in low-income, food net-importing countries, whose citizens suffer from hunger and malnutrition because of price fluctuations. In times of climate crisis, seeds are also scarce. Genetically Modified Organisms have been presented as the answer to this problem. Caritas organisations' response has been to run adaptation projects in a number of countries, especially those most prone to drought, so that farmers can continue cultivating their land and can rely on steady yields. The Caritas confederation also calls for early-warning systems, to reduce vulnerability and the risk of disasters and advocates for fair pricing and access to food at all times.

Food security cannot be guaranteed, least of all in times of climate disasters, without good governance by States at a national and local level. The FAO *Guidelines on the progressive realisation of the right to food* promote democracy and good governance from the outset: good governance is essential to "empower individuals and civil society to make demands on their governments, devise policies that address their specific needs and ensure accountability" (Guideline 1.2) and it's "an essential factor for sustainable development, poverty and hunger eradication" (Guideline 1.3).

Caritas calls for local people and communities to be genuinely and effectively consulted in decision-making processes, as well as for accessible monitoring channels and reporting requirements. While States bear the primary responsibility to guarantee the right to food, the principle of civic participation was established in environmental matters by the UN Conference on Environment and Development (1992) and applied to all sustainable development issues in 2012 by the "Rio+20" summit. All concerned people need to be involved in decision-making, planning and implementing policies and programmes at all levels, to guarantee legitimacy, ownership and success.

This paper provides examples of Caritas' advocacy and cooperation with public authorities to protect rural communities. Other aspects of the connection between food security and climate change addressed in this paper are: equality between women and men, health, social cohesion, stewardship of Creation and forced migration due to climate change.

The experience and reflections of Caritas organisations are illustrated by the projects implemented on all continents. Useful lessons have been learnt and criteria for good practice can be drawn from them.

This paper is not produced for the Caritas confederation alone. Its rich mix of experience and reflection provides useful lessons and ideas for orienting, challenging and improving policy and law-making processes at national and global levels. The long-term aim of this paper is to guarantee food security for the most vulnerable people in the face of irreversible environmental conditions caused by climate change.

We hope it will prompt in every reader – Caritas advocate or project manager, institutional representative, policy maker, analyst or legislator – the genuine desire to protect and improve the life of the poorest.

Recommendations

Caritas has identified the following key messages for policy and advocacy:

- The equal dignity of every person entails the equal right to food for everyone. We are all called to enhance the well-being of our brothers and sisters in need, ensuring the ability of all people to access food and to fulfil their other basic human needs, in solidarity and according to the principle of subsidiarity.
- The right to food must be at the heart of all policy decisions, particularly those on climate change, and the foundation for a reform of global food governance.
- Small-scale agriculture and agro-ecology, particularly family-based, must be promoted as successful strategies for food security, community adaptation to climate change and mitigation. Substantial investments must be made in sustainable and agro-ecological small-scale, rural and urban agriculture.

Such investments must have a pro-poor focus, increase productivity and enable less wealthy consumers to benefit from lower food prices.

- Smallholder farmers and farmers' organisations must be actively consulted in the design and implementation of any decision taken on agriculture under the UN Framework Convention on Climate Change (UNFCCC), related national programmes, and any other processes affecting them.
- The importance of women farmers must be stressed and promoted; they must be guaranteed the same access as men to the resources they need – land, livestock, labour, education, financial services and technology.
- Improved systems of food production, stockpiling, distribution and access to local markets can all help to cope with climate change. Such measures should contribute to sustainability and receive financial support mostly from rich countries.
- The issues of land tenure and water conservation must be addressed, also with a view to eliminating land grabbing. To secure these aims the FAO *Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security* must be fully implemented by governments and by the business community to protect local populations from unfair land deals, ensure transparency and effective civil society participation and conduct preliminary human rights impact assessments. Compulsory accountability frameworks must be put in place, including complaint mechanisms for just reparation in cases of unlawful land grabbing. Caritas organisations should monitor land issues in the countries where they work and raise awareness around land titles.
- All developed countries should establish goals to reduce the production and consumption of "first generation" agro-fuels; Caritas calls for a moratorium on imports of this type of agro-fuel into the EU and on subsidies that encourage their large-scale production.
- Long-term adaptation strategies have to be developed at community level; in particular, vulnerable farmers in developing countries must have access to the financial and technological assistance required to cope with the impacts of climate change. Priority should be given to planning and investing in integrated water resource management with adequate community involvement.
- Locally-driven initiatives must be supported, especially those promoting traditional adaptation mechanisms; good practice exchange and mutual learning should be encouraged.
- Investment in research and science involving local communities and building on traditional knowledge is needed to inform adaptation policies and programmes.
- Further research should be conducted to better understand forced migration as a result of climate change and to study in depth the concept of climate migrants, with a view to providing legal protection for them.

Part I: Understanding today's challenges

Providing food for the hungry is a priority in the Caritas vision of One Human Family, Zero Poverty. Food is the most simple, basic need but also a source of delight and joy. In Western countries, food is too often taken for granted, regularly not consumed and frequently wasted in large amounts.[1] In developing countries, where most people live in rural areas and poverty is widespread, the lack of food is both an appalling reality and a political and social priority. This extreme form of material deprivation hampers human development and assaults human dignity.[2] Food security, however, does not simply refer to material human needs. The following reflection explains how food security also bears a spiritual and transcendental value.

A. Food: a theological and spiritual concern

Food is the most simple, basic need and concern; food is a genuine desire of humankind. All Creation needs food before and above anything else. Food is the only earthly need to which the Bible constantly refers. But food does not just respond to material needs: it also bears a spiritual and transcendental value. In the "Our Father" we pray for "our daily bread", as a gift of God to be shared in togetherness and solidarity. The bread of the Eucharist, offered for all in immolation, makes visible the incarnation of the Word of God through the symbol of food. The multiplication of bread indicates, among others, the common responsibility to provide food for all ("give them some food yourselves" (*Mt* 14:16)). Food security for all is a paramount moral imperative. The equal dignity of every person entails the equal right to food for everyone. The right to food responds to an ethical motivation: "give the hungry to eat" (*Mt* 25:35), intrinsically linked to the defence of human life. Food is the fruit of Creation, which is itself a gift of God. Mankind must respect and take care of Creation like stewards, for the common good of the human family. Human work is commanded to accomplish this duty and necessary to ripen the fruit of Creation.

A biblical approach to food[3]

The Bible shows us that mankind must eat to live. This dependence on material food is a sign of our inconsistency as well as a call for us to nourish ourselves with God, especially His will (*Jn* 4:34), which only has consistency. Food is considered as a gift from God: "I give you every seed-bearing plant … and every tree that has fruit with seed in it" (*Gen* 1:29ff), and all living creatures to be your food (*Gen* 9:2–3). But if food is a gift from God, it is equally true that we should feed ourselves with the fruit and plants we grow, the animals we raise and that belong to us, namely, the fruit of our efforts (*Gen* 3:19), the work of our minds and our hands (*Deut* 14:29).

We produce enough food to feed the world, but *one in eight people still go hungry*.[4] This illustrates the risk that exists since the beginning of the separation between the divine and the human, to use the food to excess and fall into poverty (*Prov* 23:20ff; 21:17). Even worse, mankind may use food selfishly and fall prey to luxury (*Am* 6:4) or even get to exploit the poor (*Prov* 11:26), forgetting that all food is a gift from God, and combined with good times at work (decent work), together they account for a substantial part of human happiness (*Eccles* 2:24).

According to the Gospel, the golden rule for access to adequate nutrition is also to leave it up to providence (*Mt* 6:11) and each day to ask for daily bread from the Heavenly Father in our prayers (*Mt* 6:11). Access to adequate nutrition assumes a decisive social dimension in the blossoming of individuals and strengthening solidarity ties among families and other human circles. Indeed, access to food allows us to meet each other on a regular basis (*Ps* 128:3), in an environment with family or friends – around a table, calabash or bowl – to share meals and wonderful times, thanks to divine generosity and human efforts. And on this occasion, we should give thanks to God (*Deut* 8:10), who magnanimously distributes bread (*Mk* 7:25–44). This helps us realise and understand that food is not just a commodity for consumption. It has an important and often a sacred role in building compassionate and reconciled communities "where we who are strong have an obligation to bear with the failings of the weak, and not to please ourselves" (*Rm* 15:1).

Therefore, refusing access to daily bread – a gift from God and the fruit of human labour – to a person or group of people who are disadvantaged constitutes an attitude of disrespect for human dignity, which as well as creating social inequality is also an affront to Jesus (*Mt* 25) and the poor, and an act of contempt towards the community (*1 Cor* 21–22). In the same vein, the Fathers of the Second Vatican Council affirm: "a man who is hungry needs not only material bread, but also dignity and meaning to life", so refusing to provide what is indispensable for those in extreme need is depriving them of a fundamental right. And as a provocation to those who govern the world they warn: "Feed the man dying of hunger, because if you have not fed him, you have killed him" (*GS* No 69).

Food and shared responsibility[5]

When a person is inspired by the word of God, he or she perceives human actions by

considering their consequences both on the individual (individual responsibility) and on the family and community members, namely ancestors (collective, inter-generational responsibility (*Ex* 34:7; 2 Sam 21:5–6; 24:13)). A shared sense of responsibility in its past, current and future dimension is thus present in the biblical vision of the functioning of human society. From the same standpoint the Compendium of the Social Doctrine of the Church states: "The principle of solidarity requires that men and women of our day cultivate a greater awareness that they are debtors of the society of which they have become part. They are debtors because of those conditions that make human existence liveable, and because of the indivisible and indispensable legacy constituted by culture, scientific and technical knowledge, material and immaterial goods and by all that the human condition has produced. A similar debt must be recognised in the various forms of social interaction [campaign on nutrition and human dignity], so that humanity's journey will not be interrupted but remain open to present and future generations, all of them called together to share the same gift in solidarity."[6]

Catholic Social Teaching and food justice

The dignity of every human life is the foundation for Catholic Social Teaching (CST). Hence, CST is intrinsically connected to the issue of hunger. The dignity of the human person calls us to be concerned for the lives and welfare of all peoples and food is the most basic of our needs. The Gospel calls us to action on behalf of the poor, especially those who do not have access to food. As we farm our precious earth to feed God's people, we are urged to be good stewards of the Earth's resources. And as global citizens and God's children, our rights and responsibilities include the issue of food security.

Every person has a right to life and to the material and spiritual support required to live a truly human existence. The right to life for all persons, based on their identity as precious children of God, means that all people have basic rights to those things that are necessary for them to live and thrive, including the right to food. The right to food and nutrition is essential to sustain life and to enable a person to develop in dignity. The poverty and hunger that affect the lives of hundreds of millions in the world offend human dignity and demand a response from the Church, as pointed out by Blessed Pope John Paul II: "By virtue of her own evangelical duty the Church feels called to take her stand beside the poor, to discern the justice of their requests, and to help satisfy them, without losing sight of the good of groups in the context of the common good" (*Sollicitudo Rei Socialis* 39).

The Preferential Option for the Poor implies that the primary goal of public policies should be to ensure access to food for all people and to reduce poverty among the most vulnerable. Agriculture, trade, and development should be fair and promote the welfare of smallholder farmers and consumers, especially in poorer countries. Important moral measures of the global food and agricultural system are how their weakest members of society are treated and whether the system provides access to adequate nutrition for all. In that regard, Pope Benedict XVI strongly stated that "What is missing (…) is a network of economic institutions capable of guaranteeing regular access to sufficient food and water for nutritional needs, and also capable of addressing the primary needs and necessities ensuing from genuine food crises, whether due to natural causes or political irresponsibility, nationally and internationally."[7]

The world is not just a market, it's the home of our one human family. Our interdependence crosses national, ethnic and cultural boundaries. We are called to enhance the well-being of our brothers and sisters in need, ensuring the ability of all people to access food and to fulfil their other basic human needs. Solidarity leads us to support the development of organisations and institutions at the local, national and international levels to serve the needs of all. The concept of subsidiarity reminds us of the limitations of these organisations and defends the freedom of initiative of every member of society. In the case of food and agriculture, solidarity and subsidiarity lead us to support policies that protect smaller, family-run farms, which not only produce food but also provide livelihoods and a foundation for rural communities.

All of us are called to a special respect for God's Creation. "Christian love forbids choosing between people and the planet. It urges us to work for an equitable and sustainable future in which all peoples can share in the bounty of the earth and in which the Earth itself is protected from predatory use."[8] Nurturing and tilling the soil, harnessing water to grow food and caring for animals and their habitats are forms of this stewardship. The Church has repeatedly taught that the misuse of God's Creation betrays the gift God has given us for the good of the entire human family. Science has proved that global climate change has led to alterations in weather patterns that have hindered the ability of a significant number of people to access food. We must be especially attentive to the impacts of climate change on the poor.

B. Definitions and concepts

The right to food

The right to food was first recognised in 1948 in the Universal Declaration of Human Rights: "Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food…"[9]

It was later incorporated into the 1966 International Covenant on Economic, Social and Cultural Rights (ICESCR). Article 11.1 and 11.2 assert:

1 …the right of everyone to an adequate standard of living for himself and his family, including adequate food (…)
2 The States Parties (…) recognising the fundamental right of everyone to be free from hunger, shall take, individually and through international co-operation, the measures, including specific programmes, which are needed:
   (a) To improve methods of production, conservation and distribution of food by making full use of technical and scientific knowledge, by disseminating knowledge of the principles of nutrition and by developing or reforming agrarian systems in such a way as to achieve the most efficient development and utilization of natural resources;
   (b) Taking into account the problems of both food-importing and food-exporting countries, to ensure an equitable distribution of world food supplies in relation to need.[10]

In 1988, the Right to Food was also recognised in the Additional Protocol to the American Convention on Human Rights in the Area of Economic, Social and Cultural Rights ("Protocol of San Salvador"):

1 Everyone has the right to adequate nutrition which guarantees the possibility of enjoying the highest level of physical, emotional and intellectual development.
2 In order to promote the exercise of this right and eradicate malnutrition, the States Parties undertake to improve methods of production, supply and distribution of food, and to this end, agree to promote greater international cooperation in support of the relevant national policies."[11]

The right to food was authoritatively interpreted and explained in 1999 by the UN Committee on Economic, Social and Cultural Rights in its General Comment, no. 12:

(…) the core content of the right to adequate food implies: (a) the availability of food in a quantity and quality sufficient to satisfy the dietary needs of individuals, free from adverse substances, and acceptable within a given culture; and (b) the accessibility of such food in ways that are sustainable and that do not interfere with the enjoyment of other human rights."[12]

General Comment no. 12 also defined the concepts of food availability, acceptability and accessibility and made an explicit connection between the right to food and the issue of sustainability, implying a long-term vision to make food accessible to future generations.[13]

These legal definitions remind us that, in order to guarantee the right to food and food security States bear precise obligations: to respect, protect and fulfil the right to food. Governments must refrain from actions that would prevent access to food (respect).They have a duty to protect everyone's access to adequate food against destruction by a third party, for example by a neighbour, or corporation and to punish third parties' misconduct (protect). Finally, governments must pro-actively create the conditions for access to food for those in need (fulfil).[14]

In the context of climate change, these obligations suggest, for example, refraining from policies that damage the environment and so prevent access to food (respect); regulating companies' activities and monitoring their impact on the environment

Honduras: more skills, more food

Caritas Honduras believes that, with more knowledge and skills, families and the community as a whole will be able to produce more and better-quality food. Its projects, designed to respond and adapt to climate change, are based on "economia solidaria" (solidarity economy). A key component is working closely with – or even setting up – local producer organisations. Caritas has helped such groups to clarify their goals and to draft regulations so they could become a legal entity. The projects also include: micro drip-irrigation; marketing surplus crops to increase the family's income; and education on basic sanitation, nutrition and community advocacy.

There are many lessons to be drawn from this experience: communities are more likely to "own" projects that they themselves drive; projects should be targeted at individual families and local producer groups; more investment should be made in infrastructure and small-scale production technology as an adaptation measure to climate change.

and on local communities (protect); providing alternative sources of livelihood in case of land loss (fulfil).[15] These obligations are not only binding within a State's borders, but apply to foreign policy relations with other States and non-State actors.[16] For climate change and food security, this means for example that States should introduce policies and work with other countries to reduce greenhouse gas (GHG) emissions, because they affect the right to food across international boundaries.[17]

Concrete guidance on the implementation of the right to food was provided in 2004, with the adoption of the *Voluntary Guidelines to Support the Progressive Realization of the Right to Adequate Food in the Context of National Food Security*[18] under the umbrella of the UN's Food and Agriculture Organisation (FAO). These guidelines are a valuable tool for governments to design and improve their policies and programmes from a human rights perspective.[19]

The Optional Protocol to the International Covenant on Economic, Social and Cultural Rights, adopted in 2008[20] which entered into force on 5 May 2013,[21] finally enables individuals or groups to bring a complaint at UN level against a State for violations of any of the rights set forth in the ICESCR[22] – including the right to food. This is a milestone in the international human rights system.[23] It also gives the UN Committee on Economic, Social and Cultural Rights competence to conduct inquiries, in cases of grave or systematic violations by a State,[24] and to consider inter-State communications.[25]

Guaranteeing the right to food must be the guiding principle and overarching objective of all policies and country cooperation strategies.[26] For Caritas, it means ensuring that the most vulnerable – more than one billion people living in extreme poverty in the world[27] – are both the beneficiaries and the drivers of agriculture and food security policies in all countries.

Solar Maya: achieving food sovereignty in Mexico

The Solar Maya project in southeast Chiapas, Mexico, was designed to help families affected by Hurricane Stan in 2005 to become self-reliant and to improve their diet and income. It is based on the "economia solidaria" (solidarity economy) model and uses the "paso en cadena" (chained steps) approach.

Caritas trained a man and a woman in each community in sustainable farming practices, including organic fertilisers, using less environmentally damaging techniques for rearing livestock, and growing crops alongside trees and shrubs. In turn, these men and women shared what they'd learnt with their community. They were also given animals, seeds or fruit trees to supplement the family diet and to boost their income, by selling excess produce. At the end of the project, each family gave a family in a new community what they themselves had received at the beginning – for example, two chickens and a rooster, or seeds – so the new family could start their own Solar Maya. The project began with one community and through "paso en cadena" has reached another 31.

Communities are left with a good set of skills in animal production and other techniques, as well as seeds or livestock, which means they become self-reliant, are able to feed their families and to pass on their knowledge to others. The project also has social benefits – it encourages families to work together because everyone has to participate, and it creates harmony between participating families. It is also a good example of how men and women can contribute equally to the life of their community.

Food security

Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life.[28]

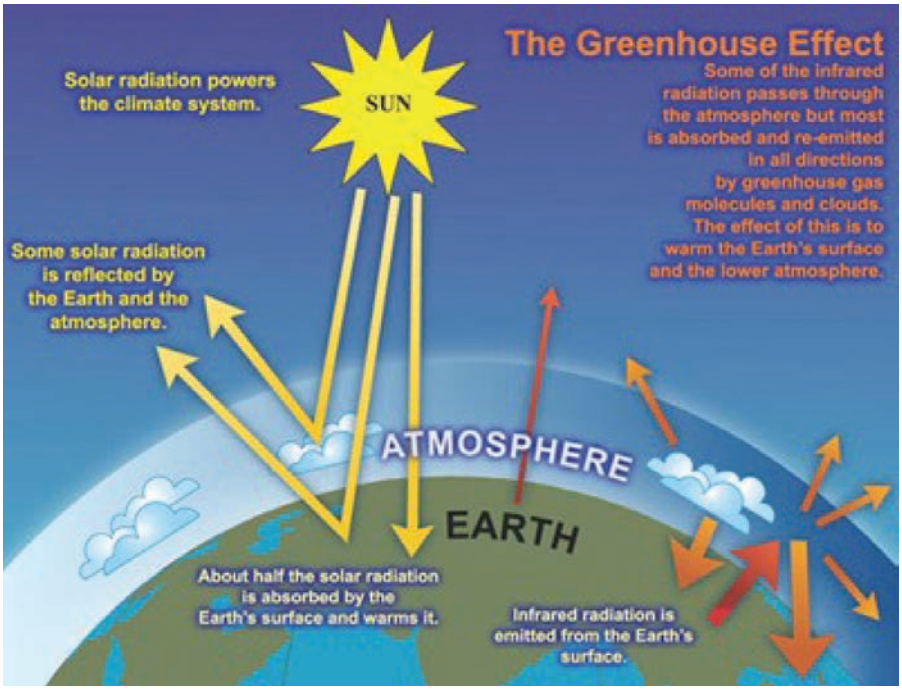
This definition is the most widely accepted within the international community,[29] and is the result of an evolving understanding of food security. This shifted from the sheer ratio between how much food could be produced globally and the expected demand, to a better distribution of food through national food security policies encompassing both food production and imports, to finally a notion also considering access to food (entitlement) for individuals and groups.[30]

In a 2006 policy brief on this topic,[31] FAO outlined the following widely accepted dimensions of food security:

- *Food availability:* The availability of sufficient quantities of food of appropriate quality, supplied through domestic production or imports (including food aid).
- *Food access:* Access by individuals to adequate resources (entitlements) for acquiring appropriate foods for a nutritious diet. Entitlements are defined

as the set of all commodity bundles over which a person can establish command given the legal, political, economic and social arrangements of the community in which they live (including traditional rights such as access to common resources).

- *Utilisation:* Utilisation of food through adequate diet, clean water, sanitation and healthcare to reach a state of nutritional well being where all physiological needs are met. This brings out the importance of non-food inputs in food security.
- *Stability:* To be food secure, a population, household or individual must have access to adequate food at all times. They should not risk losing access to food as a consequence of sudden shocks (for example an economic or climate crisis) or cyclical events (such as seasonal food insecurity). The concept of stability can therefore refer to both the availability and access dimensions of food security.



Source: Intergovernmental Panel on Climate Change, 2007

To understand the impact of climate change on food security and devise appropriate responses, it is important to analyse three levels. First, the effects of climate change on agricultural production and fishing at a global level, and how this translates into food prices and multilateral trade. Second, national policies and how they affect imports or investment in agriculture and climate adaptation. Finally, at a household level: to understand specific and individual conditions (income, marginalisation and vulnerability) that determine food security.[32] This level is not necessarily related to food production, and may make inaccessible food otherwise available. Food security should therefore be seen as the result of the interaction between global trends (including climate change), national policy choices and the human circumstances affecting food access and use.

Vulnerability and resilience

Vulnerability to climate change indicates the degree to which poor people and poor countries are susceptible to and unable to cope with the adverse effects of climate change, causing a decline in their well-being. The degree of vulnerability depends on the character, magnitude and frequency of climate variations, as well as on the adaptive capacity of a community.[33] Vulnerable communities have little or no ability to address, implement or manage their preparedness, response to, or recovery from climate change. These communities are usually located in developing countries (especially the Least Developed Countries (LDCs) and Small Island Developing States (SIDS)) which are particularly vulnerable to the adverse effects of climate change (such as low-lying and small island countries, countries with low-lying coastal, arid and semi-arid areas or areas liable to flood, countries facing monsoon variability, drought and desertification, and developing countries with fragile mountain ecosystems).[34] In the longer term, urban communities will also suffer from the effects of climate change through lower production, water scarcity and higher food prices.

Resilience refers to the ability of people or communities to absorb and recover from the effects of hazards (recurrent or not) and to re-organise themselves, integrating these changes, while retaining the same basic structure, the same functioning, the same identity and capacity to react and adapt.[35] Resilience to climate change has become urgent, especially for poor communities, and must be addressed through prevention,

training, capacity-building and equipment. In this context, the close connection between humanitarian aid and development must be highlighted, as well as the importance of investing in long-term resilience strategies like social protection. Guiding principles for resilience-building have been identified as the establishment of reliable early-warning systems, of alliances and institutional relations at all levels, capacity-building, identification of different types of crises and early reaction, and advocacy in defence of the most vulnerable.[36]

Food sovereignty

The term "food sovereignty" was coined in 1996 by La Via Campesina,[37] an international movement of about 150 organisations advocating for family farm-based sustainable agriculture. This movement defends the equitable distribution of land, water, technology and other resources as public goods, seeking to defend diversified production systems, particularly those that are the result of family farming. Food sovereignty is a people's right to nutritionally and culturally appropriate food which is accessible and produced in a sustainable and environmentally friendly way. It includes people's right to decide on their own food and production systems, as opposed to letting food security be dictated by global market forces. Food sovereignty puts those who produce, distribute and consume food at the heart of food policies and systems, above the demands of the market and businesses.[38] The former UN Special Rapporteur on the Right to Food, Professor Jean Ziegler, described the connection between food sovereignty and food security: "Food sovereignty offers an alternative vision that puts food security first and treats trade as a means to an end, rather than as an end in itself."[39]

The Council of Bishops' Conferences of Latin America and the Caribbean (CELAM) has regularly reflected on the situation of farmers, poverty, development and the environment in Latin America. At its Puebla Conference,[40] it outlined multiple causes of poverty, including: economic systems that do not contribute to social justice, the lack of agrarian reforms giving farmers access to land and to the means to improve production and marketing, the presence of self-interested multinational corporations and the loss of value of local raw materials.

In Aparecida,[41] CELAM stressed that globalisation without solidarity negatively affects the poorest, creating social exclusion, especially among indigenous and African-American communities.[42] This Conference drew attention to the suffering of poor farmers who do not have access to land of their own, because of *latifundia*[43], Free Trade Agreements concluded with developed countries, and the use of land for drug production.

The uncontrolled industrialisation of land and cities, which contaminates the environment with chemical and organic waste, as well as deforestation and water contamination caused by extractive industries, were also identified as causes of disempowerment and environmental degradation.[44] They are some of the root causes of food insecurity that also contribute to human-induced climate change. The current development model is based on a free market economy, trade liberalisation, de-regulation and privatisation of natural resources, coupled with weak agrarian policies. This has deprived indigenous and farming communities of their way of life and been an obstacle to pro-poor development. In response, Caritas and other Catholic organisations have intervened in various ways, for instance: rural schools that promote farmer organisations, legal and political advocacy, civic participation and advocacy on social, economic and trade issues, projects improving agriculture, livestock breeding, infrastructure, technology, agro-forestry[45] and reforestation, solidarity economy, health, nutrition, water and sanitation for vulnerable communities.[46]

Innovative farming approaches in Mongolia

In the harsh climate of Mongolia, Caritas extended the vegetable growing season using three innovative designs: passive solar greenhouses, trench greenhouses and bio-climatic cellars. They will also save 500 tonnes of carbon dioxide per year. The project was funded by the European Commission and Secours Catholique (Caritas France); it ran from August 2010 to July 2013. The project aimed to increase vegetable production in order to make more food available and to increase family income through selling the excess produce; and to improve the diet of vulnerable families in Ulaanbaatar and Gobi Altai province in Mongolia. It involves 340 families of whom half are female-headed, and 22 community-based groups. The most vulnerable families, who hadn't benefited from government initiatives as a consequence of stigmatisation, were enthusiastic about these well-designed technologies suited to the cold Mongolian climate.

Climate change and the effects of global warming

The earth's climate is a complex and interactive system. It has changed many times in response to natural causes, however the term climate change as it is used today usually refers to those changes that have occurred since the early 1900s.[47] The term "climate" means "average weather" as the statistical description of the weather in terms of the mean and variability of relevant quantities over periods of several decades (typically three decades as defined by the World Meteorological Organisation).[48] Climate change happens because of an increase of greenhouse gases (GHGs) in the atmosphere.[49] The greenhouse effect is, in fact, a natural warming process of the earth. When solar energy reaches the earth, some of it is reflected back into space, while the rest is absorbed. The absorbed energy warms the earth's surface, which then emits heat energy back towards space as long wave radiation. This outgoing long wave radiation is partially trapped by greenhouse gases such as carbon dioxide, methane, nitrous oxide and water vapour, which then radiate the energy in all directions, further warming the Earth's surface and atmosphere. These GHGs are in the atmosphere naturally; without them, the Earth's average surface temperature would be about 35° C cooler and would not sustain human life.

Even though the evolution of the Earth's climate and atmosphere is not fully known to us, there is now overwhelming scientific consensus that human activities such as deforestation and the burning of fossil fuels have increased the concentrations of GHGs in the atmosphere.[50] The Intergovernmental Panel on Climate Change defines climate change as "a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods.".[51] In the past 250 years, carbon dioxide levels have increased by 35 percent, methane by 153 percent and nitrous oxide by 15 percent.[52] Higher GHG concentrations lead to an enhanced greenhouse effect, which leads to global warming and, ultimately, to climate change. Some scientists even believe we are entering a new phase of geological time, dubbed the *Anthropocene*, because of the impact that humans have had on the Earth.[53] Clearly, a fundamental change in human behaviour is urgently needed in order to stop the degradation of the Earth's climate.

Haiti and the Dominican Republic: vegetable gardens

The best way to tackle the impact of climate change on poor people is by designing development projects that incorporate climate adaptation. For the last six years, Caritas Spain has been working with Caritas Haiti and Caritas Dominican Republic to help communities living along the Haitian-Dominican Republic border with projects that include healthcare, drinking water, nutrition and vegetable gardens.

Poverty and a lack of variety in their diet meant 22 percent of children in this area were malnourished. In response, Caritas provided training, seeds and fruit trees and gardens were built on both sides of the border. Seventy communities took part and, over a four-year period, 1640 vegetable gardens were created. All family members had to be involved, and in some cases, several families joined together to make one big garden where everyone benefited equally. Families also earned money by selling excess produce. After four years, child malnutrition has been halved thanks to a ready supply of fruit and vegetables, and to health education, targeted at mothers and children.

There were many useful lessons. Crop diversification and sharing knowledge and skills between local people and technical staff proved key to addressing issues such as garden pests. Using local varieties and tapping into local knowledge is also vital to the success of the project, as well as encouraging farmers to share their experiences and best practice.

Climate adaptation

The *Third Assessment Report* of the Intergovernmental Panel on Climate Change (IPCC) defines climate adaptation as:

> Adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities. Various types of adaptation can be distinguished, including anticipatory and reactive adaptation, private and public adaptation, and autonomous and planned adaptation.[54]

Four years later, the United Nations Environment Programme further clarified the term by adding that climate adaptation is:

a process by which strategies to moderate, cope with and take advantage of the consequences of climatic events are enhanced, developed, and implemented.[55]

The continuing trends in climate change have made adaptation necessary. This may take many forms, such as preparing for more frequent storms, relocating away from coasts or moving to food and water secure areas in anticipation of prolonged droughts.[56]

Climate mitigation

Mitigation refers to minimising climate change by reducing the amount of greenhouse gases produced and released into the atmosphere, or by absorbing such gases (for example by planting forests).[57] Climate change mitigation is defined by the IPCC Glossary Working Group III as:

Technological change and substitution that reduce resource inputs and emissions per unit of output. Although several social, economic and technological policies would produce an emission reduction, with respect to climate change, mitigation means implementing policies to reduce greenhouse gas emissions and enhance sinks.[58]

Switching to renewable energies, improving the insulation of infrastructure to conserve energy, modernising transportation to more energy-efficient technologies, avoiding the destruction of the carbon sinks[59] of our forests are all mitigation initiatives that can reduce the impacts of climate change. Caritas believes that the climate change challenge can only be met when we are all, as individuals, communities and society,[60] prepared to change our consumerist behaviour and adopt new lifestyles. Pope Benedict XVI, too, called upon us to question our lifestyle. Quoting his predecessor, Blessed John Paul II, he said:

"What is needed is an effective shift in mentality which can lead to the adoption of new lifestyles in which the quest for truth, beauty, goodness and communion with others for the sake of common growth are the factors which determine consumer choices, savings and investments".[61]

For communities to continue to have enough food in the face of climate change, agricultural practices need to be transformed. Transformations that include carbon sequestration (see below) can positively contribute to mitigating climate change. Though one school of thought claims that carbon markets will not benefit smallholders and may even damage the environment (see below), others believe there are potential income-generating opportunities for smallholder farmers through payment for environmental services. Substantial analysis and innovation is needed to find ways to reduce poverty and improve food security for poor people in rural areas, as well as reducing emissions.[62] Before dismissing carbon sequestration, it is worth considering recent success stories.

Growing trees and selling carbon

The International Small Group Tree Planting (TIST) programme aims to plant ten million native trees over a five to ten year period in Nicaragua and Honduras and sequester 3.3 million tons of carbon. It is a joint initiative of Catholic Relief Services (CRS) with Clean Air Action Corporation (CAAC) and the Institute for Environmental Innovation (I4EI). Participating Farmers organise into small groups and plant trees which naturally capture carbon as they grow. This stored carbon is "sold" on the international carbon market to companies or individuals who want to offset their own carbon emissions, farmers receive annual carbon credit payments from CAAC for every tree they plant and keep alive over a 30-year period. Planting schemes include tree lots, intercropping with trees and the planting of dual-use fruit and nut trees. After a ten-year period farmers have the right to selectively harvest up to five percent of trees planted.

The programme builds on the success of TIST in East Africa where over 70,000 farmers took part. The expansion into Latin America began with a 12-month pilot phase in September 2010 and will run for five years. It will also include a pilot of micro-REDD (Reduced Emissions from Deforestation and Degradation) where CRS and TIST will allow small farmers who protect their existing forest lands to receive carbon credits. TIST lays the foundation to create a mechanism for programme supporters to reduce their carbon footprint by donating or purchasing carbon credits through CAAC, or directly through CRS.

C. The connection between climate change and food security

Climate change affects food security because modifications in climate patterns fundamentally affect agriculture.[63] It is usually the poorest people, particularly

those in rural areas and ironically those who have contributed the least to global warming, who are the most affected by climate change. In the global South, smallholder farmers already experience many of the consequences of climate change, reporting that rains come earlier, drought lasts longer, fresh water is scarcer because of rising sea levels and storm surges, cyclones and other extreme weather events are more frequent and intensive.[64]

Other effects of climate change include: a reduction in agricultural productivity; changes in water quality, quantity and availability; rising sea levels with intensified flooding, stormy seas, erosion and the salinisation of coastal water sources; an increase in coral bleaching and the death of reefs and their ecosystems, with impacts on fishing and tourism; social and economic damage because of more frequent and intense extreme weather events; a rise in temperature and a reduction of ground water leading to the gradual extinction of tropical forests.

Rises in temperature cause more frequent and severe droughts, which in turn affect crop yields. In dry land tropical areas, crops are more likely to fail and livestock is more vulnerable to disease, often forcing smallholder farmers to sell their livestock and other essential belongings for survival, or to migrate. Many may become dependent on food aid or fall into debt. Human development indicators – such as health and education – will also worsen if the global temperature rises.[65] As extreme rainfall and flooding increases, particularly in areas with underdeveloped sanitary systems, the risk of water-borne and vector-borne diseases such as cholera and malaria will increase.

Pests and plant diseases are likely to spread, as are vector-borne diseases affecting livestock. Fishing is also adversely affected by climate change both in the short term, because of changes in ocean currents, and in the long term because of increased ocean acidity. Rising sea levels will cause land loss, change river flows and contaminate agricultural land with salt water.

The most dramatic impacts of climate change, such as the complete submersion of island states, may not be seen for some time. But increased migration due to climate change will soon put further pressure on already unsustainable food production systems. Displacements caused by frequent extreme weather events and natural disasters are now challenging an already stressed international humanitarian system.[66] Floods, cyclones, tropical storms, tornadoes and tsunamis may force affected communities to leave their land immediately. Some researchers have coined the term "climate refugees" to describe people affected in this way.[67] But migration due to climate change may also happen gradually, as natural resources become scarce because of drought, salinity, river erosion or rising sea levels. People who do not have means to adapt are forced to migrate in search of new ways to make a living. The risks are high for the world's mega-cities (population of more than 10 million): of the 16 that lie on the coast, 12 are in developing countries. Obviously, in all situations poor people carry the highest risk.[68] In times of political turmoil, forced migration can further aggravate conflicts. In Sudan, for example, desertification and

The effects of climate change on water in Bangladesh

Lying between the Sundarbans forest and the Bay of Bengal, Bagerhat is one of Bangladesh's most vulnerable coastal regions. Much of the land is contaminated by salt and cannot be farmed, forcing extremely poor families in 25 villages in Mongla and Rampal to eke out a living through casual labour, foraging for food and materials in the forest, and shrimp farming. When their shrimps became diseased, poor shrimp farmers were forced to lease their land to landlords, who then cultivated shrimp in unsustainable ways, damaging the environment and the biodiversity of the area.

Caritas Khulna implemented a project to counter the effects of climate change involving both adaptive and mitigation measures. Adaptive measures included growing crops in raised beds to overcome the problems of salinity and water logging; using plastic and cement tanks to collect rainwater for drinking and irrigation; cleaning and maintaining ponds for drinking water and irrigation; and a "farmer field school" to share local knowledge and techniques.

Mitigation measures included: planting environmentally friendly medicinal and local fruit trees for carbon sequestration; improved furnaces; and teaching local people to use climate-friendly lights. As an alternative to shrimp farming, Caritas trained people to rear livestock, provided chickens, and supplied materials to build cages. The project has shown potential to increase the number of beneficiaries in the region.

water scarcity created conflicts between nomadic and sedentary communities over water and land, and spurred migration from rural areas to cities, putting health services, and food and water resources under extreme pressure.[69]

As early as 1990 the IPCC noted that climate change's greatest impact might be on human migration, with millions of people displaced by shoreline erosion, coastal flooding and agricultural disruption. Subsequent reports have argued that environmental degradation, and in particular climate change, is likely to become a major driver of population displacement. In the mid-1990s, it was widely reported that up to 25 million people had been forced from their homes and off their land by pollution, land degradation, droughts and natural disasters. At that time, these "environmental refugees" (as they were called) were said to exceed the number of all known refugees from war and political persecution put together.

The 2001 World Disasters Report of the Red Cross and Red Crescent Societies repeated the estimate of 25 million environmental refugees. In October 2005 the UN University Institute for Environment and Human Security warned that the international community should prepare for 50 million environmental refugees by 2010. The Norwegian Refugee Council indicated that as many as 20 million people may have been displaced by climate-induced sudden-onset natural disasters in 2008 alone.[70] A 2009 report by the International Organization for Migration produced in cooperation with the United Nations University and the Climate Change, Environment and Migration Alliance quoted numbers ranging from 200 million to one billion migrants from climate change by 2050. Professor Myers' estimate of 200 million climate migrants by 2050 has become the accepted figure and included in IPCC publications and the Stern Review on the Economics of Climate Change.[71]

To date, there is no accepted definition or legal recognition of the status of "climate refugees", who are often destitute, which means their needs cannot be addressed and their human rights cannot be guaranteed.[72] After a forced displacement, a person's long-term needs relate to issues of

Kiribati

Kiribati stretches 3,5 million km^2 [77] across the Central Pacific and is made up of 33 coral atolls only 3–4m above sea level. It is one of the most remote and isolated countries in the world with a population of 108,000, most of whom are subsistence farmers, heavily dependent on natural resources such as coconuts, bwabwai, breadfruit, banana and pandanus. The freshwater lens[78] of larger atolls provides most of the water for agriculture, and the depth and quality of this lens is a crucial factor determining crop growth and yield. Few crops grow in Kiribati; the already limited food production opportunities face increased threats from the effects of climate change. People rely on coconuts for food, shelter and cash (from copra production), but coastal erosion has caused coconut trees to uproot and people to lose their land; this scenario is likely to worsen as sea levels continue to rise.

People who rely on crops are especially vulnerable to the impacts of climate change, particularly drought and saltwater contamination of groundwater through wave run-up, breaching coastal defences and inundation.[79] The degradation of marine ecosystems, so vital for fishing, also has a devastating effect: sea surface temperatures rise, corals bleach and become less productive; and tuna varieties are at risk as a result of changes in temperature and/or altered ocean currents. Sea walls traditionally protected houses and local agricultural plots from extreme waves and high tides; but now, even in urban Tarawa, people are building sea walls to prevent coastal erosion and inundation. And more walls will need to be built in areas previously considered safe as sea levels continue to rise. Raised garden beds and homes built with raised floors are becoming common, but they won't be enough to cope with the predicted scale of change.

Communities themselves have helped shape programmes to address the impacts of climate change, such as improving traditional agricultural systems, introducing drought-resilient crops, preserving food such as pandanus and taking care of natural ecosystems. The Catholic Diocese of Tarawa has developed a Climate Change Training Manual for atolls, which is being used across the islands to educate communities about the risks they face and the options available to them.

Climate change exacerbates the development challenges that Kiribati already faces, such as urbanisation, waste management, chronic health problems and environmental degradation caused by unsustainable and accelerated coastal development. Climate change adaptation must therefore be incorporated into programmes that address these key development issues.

resettlement. The UN High Commissioner for Human Rights has called for guidelines on a resettlement process based on human rights.[73] The responsibility of, and between, governments and the international community for relocation also needs to be clarified. In the meantime, some vulnerable communities have planned their own resettlement, organising themselves without waiting for their governments to act.[74] In the absence of an international convention and of specific protection under the UNFCCC (where this is discussed as an adaptation issue), guidelines for planning re-settlements, involving genuine consultation with communities, would help to protect the right of displaced people.[75] To reduce migration, preventative measures must also include food security programmes, social protection, healthcare, infrastructure and institutional development.[76]

Agricultural practices can also influence climate change trends. The increasing intensification of agriculture entails more mechanisation and more use of fossil fuels. Industrial fertilisers are made from petrochemicals that contribute to increased GHG emissions. Nitrous oxide emissions, believed to come primarily from nitrogen fertilisers used in agricultural production, trap far more infrared radiation than both carbon dioxide and methane.[80] Changing world food production and consumption patterns, such as increasing meat consumption in countries with rising incomes, lead to changes in land use, such as increase in deforestation of land for livestock production. It is estimated that the use of chemical fertilisers, increased meat production and the destruction of forests are responsible for 30 percent of emissions contributing to climate change.[81] The use of Genetically Modified Organisms (GMOs) to produce higher yields can have a detrimental effect on biodiversity. Processing, packing, freezing and transporting food all over the world result in a higher consumption of energy and more pollution.[82]

Change is needed in the way food is produced: we need a healthy shift from agro-industry to agro-ecology.[83] Lessons learned from our field work with those communities most affected by food insecurity have convinced us to support an agro-ecological model that enhances resilience by simulating natural processes, for example by recycling organic matter, diversifying cropping systems and enhancing biodiversity.[84] Agro-ecology favours local markets, is environmentally friendly, more energy-efficient, and generates higher employment and thus helps fight poverty.[85]

On the other hand, reducing long-distance transportation, and tackling food loss and food waste would also all be steps in the right direction. Simple changes in our food consumption and lifestyle patterns would undisputedly help us to influence the global food cycle and minimise its negative effects.

The Dominican Republic: agricultural diversification in El Granado

El Granado in the Barahona province of the Dominican Republic has a dry climate and in the last few years extended droughts have destroyed crops and increased people's food insecurity. Caritas has been helping farmers to produce a wider range of crops and livestock, using drip irrigation and environmentally friendly technologies and to access markets to sell excess produce. The aim is to bring back a type of farming that allows families to become self-sufficient, where seeds, animals and food are exchanged in a harmonious relationship with nature.

This project introduced the concept of "companion planting", where one plant benefits others that are planted nearby. Squash, aubergines and coriander were planted below banana trees so their leaves could provide shade, and in turn these plants enriched the soil with vital nutrients and improved irrigation. Farmers were trained on the care of their plots, including pruning, creating hybrids and pest management and found themselves going from producing a single crop to a wide range of products to sell in the market. The project also trained farmers to rear livestock. The project's success was attributed to staff well-trained in agro-ecological techniques, community participation, tailoring projects to the local climatic conditions and building on local knowledge and expertise.

More should be done to promote traditional agriculture, not only for its ecological and environmental value but also as an engine for local development, since it provides employment and better and more diverse products. A rights-based approach is also key to ensure farmers' ability to make informed decisions and exercise their rights and responsibilities accordingly.

D. Food security, climate change and sustainable development

Sustainable development, defined as "development that meets the needs of the present without compromising the ability of the future generations to meet their own needs,"[86] requires the harmonious integration of a sound and viable economy, responsible governance, people's empowerment, social cohesion and ecological integrity. From this perspective, economic growth would also be instrumental in preserving the environment. In fact, economic development allows for better capacity (in terms of knowledge, science and technology) to address environmental and social problems. Protecting the environment, in its turn, is essential for sustainable development. The interrelation between climate change and sustainable development comes from the fact that climate change is a constraint to sound development, and sustainable development is key to climate mitigation and adaptation. It follows that strategies for managing sustainable development and climate change have many common elements, so that pursuing them together is a good idea. Integrating climate change policies into national and international development agendas would also have the advantage of reducing their costs. Climate change is now recognised as an equity issue because the world's poorest people, those who have contributed the least to greenhouse gases, are also the least equipped to cope with the negative effects of climate change. Wealthier nations that have historically contributed the most to global warming are better able to adapt to its impact. Addressing disparities between developed and developing countries is therefore crucial to the success of climate change mitigation and adaptation policies.[87]

Synergy between climate change and sustainable development policies would not only cultivate economic growth, but it would also foster human development and improve the living conditions of the world's poor people, thereby enhancing social

Farmer Field Schools in India

The Centre for Environmental Studies in Social Sector (CESSS) is a Caritas India initiative in the field of Natural Resource Management (NRM) and Sustainable Agriculture Practices (SAP). Located in the Amravati District (Maharashtra), in December 2009 it started creating replicable models in sustainable agriculture regeneration measures to assist the socio-economic empowerment of farming communities. The Centre aims at creating both on-farm and off-farm sustainable development models, as well as a space for study, research and mutual learning.

A key component to the Centre's programme is the Farmers' Field School (FFS). In the pilot phase, FFS engaged 14 marginalised farmers (7 women and 7 men) in a three-year course. These farmers practised SAP (including mixed cropping, livestock management, conservation of traditional and indigenous seeds) and NRM in 2-acre study plots, as well as learning valuable marketing techniques. Initially, it was a challenge to convince the farmers to abandon chemical farming, which was supported by all existing government agricultural and environmental policies. Mono-cropping and climate change, however, were seriously affecting the production and thus the food security of poor farmers. Thanks to the motivation and encouragement of CESSS staff, the farmers successfully shifted to organic farming and even produced record yields in some cases. All farmers in the school improved their knowledge and skills; they learned to replace the high-cost agriculture practices with low-cost, local resource-based practices, that were equally, and often more, effective and environmentally friendly. FFS participants regained control over local varieties of seeds which were at the verge of extinction. Seasonal migration is rampant in the area, but FFS participants didn't have to migrate thanks to sufficient livelihood sources. The original pilot FFS farmers became trainers to other farmers, students, researchers and professionals on principles of SAP and NRM. This "train the trainer" model gave them an identity in the area as lead farmers. The extension of SAP and NAM practices regenerated the soil and helped recuperating large areas of agricultural land. FFS also promotes organic agriculture farmers' cooperatives and collectives for mutual support. The practice has now been extended to 148 nearby village farmers.

It became clear that understanding rights and entitlements is key to accessing governmental support; collective learning helps analysis and collective efforts play a catalyst role in influencing decision makers. Farmers are the best researchers: recognising and building on their traditional knowledge, and promoting them as researchers within their farms to reduce vulnerabilities improves production and self-reliance in agriculture.

cohesion. Environmental degradation is linked directly with poverty and social exclusion, proving that poverty and "ecological misery" are inseparable.[88] Ecological harmony cannot exist in a world characterised by unjust social structures; conversely, the current extreme social inequalities cannot lead to environmental sustainability.[89] International development agencies unanimously recognise that climate change seriously hampers poverty reduction and might undo decades of development efforts, and that the best way to address the impacts of climate change on the poor is by integrating adaptation measures into sustainable development strategies.[90] Achieving progress in development areas such as good governance, public finance, and human and natural resources management will build resilience to all types of shocks, including climatic ones.[91]

The UN Conference on Sustainable Development in June 2012 ("Rio+20") acknowledged climate change as a cross-cutting and persistent crisis requiring urgent and ambitious action, and explicitly connected to food security and poverty.[92] Adaptation to climate change was declared an urgent priority.[93] Arguably, the financial instruments created under the UN Framework Convention on Climate Change (UNFCCC), including the Green Climate Fund, should help mainstream adaptation throughout existing and future development programmes. "Rio+20" urged participating States to free humanity from poverty and hunger, giving prominence to the right to food.[94] It recognised protecting and managing natural resources as essential requirements for sustainable development, coupling environmental sustainability with food security and sustainable agriculture, water and sanitation.[95] "Rio+20" even called for regulations to reduce the social and environmental impacts of the mining industry.[96] While representing the current international consensus on sustainable development, where food security and climate change are clearly connected and made compatible, "Rio+20" did not succeed in introducing new binding commitments for a better world.

"Economia solidaria": a model for economic, environmental and social sustainability

In the mountains of Tarrazu in Costa Rica, an example of economia solidaria (solidarity economy) is flourishing. Founded in 1960, Coopetarrazu is a cooperative of about 3000 coffee producers who work together in producing and marketing coffee. Five hundred of the members are women, who have played an important role in the cooperative's administration and organisation. As part of its commitment to economia solidaria, Coopetarrazu follows the principles of sustainable agriculture by using, for example, coffee by-products such as pulp and molasses as organic fertilisers, thus contributing to the enrichment of the soil. It spends part of the generated income supporting community projects such as health, education and infrastructure, which not only benefit the members of the cooperative but also the community at large. It also follows good labour practices. The cooperative employs 215 full-time and 400 part-time local people, and at harvest time, another 18,000 indigenous people come from Panama and Nicaragua.

Coopetarrazu has also become a member of encadenamientos solidarios (solidarity chains), one of Social Pastoral Caritas Costa Rica's projects, which provides training and helps producers sell their goods. The Social Pastoral charges a commission to its members, which is used to finance other Caritas projects for vulnerable people. In this way the fruits of solidarity extend well beyond these communities and ensure others also have better access to food.

Part II: Structural issues affecting the link between food security and climate change

Too often, attention is diverted from the needs of populations, insufficient emphasis is placed on work in the fields and the goods of the earth are not given adequate protection. As a result, economic imbalance is produced and the inalienable rights and dignity of every human person are ignored.
Pope Benedict XVI[97]

In this section, we examine the global factors compounding the already problematic causal relationship between food security and climate change, whilst also drawing on the relevant Caritas experience and the lived experiences of the people we serve.

A. Agro-fuels

Sudan, one of the poorest countries in the world, but with huge agricultural potential, received 673,000 tonnes of food aid from the World Food Programme in 2008. In 2009, the country aimed to export 65 million litres of ethanol. While the food aid mainly benefited poor people living in rural areas who had been neglected for many years, the sale of ethanol benefited foreign investors and consumers in the developed world.[98] This paradox aptly introduces the controversy surrounding agro-fuels and their impact on food security in connection with climate change.

Agro-fuels have long been seen as an answer to reducing carbon emissions on a global scale, and therefore a valid climate change mitigation measure. On the other hand, they have been much criticised for their adverse impact on food security, especially for poor people in rural areas. The consequences of agro-fuel production vary according to each country context, the technology used and the type of crop. However, it is widely agreed that growing agro-fuels seriously reduces the amount of food available, primarily because it uses up land and water that are needed to grow subsistence crops. It is now accepted that the increased demand for fuel crops has contributed to the recent price hikes in food staples, further straining food security. Rising food prices are good news for producers of cash crops.[99] However, only a small minority of smallholder farmers have surplus to sell; for the rest, rising prices are an immediate threat to food security. On the other hand, arguments in favour of agro-fuels point at the opportunity, for producing countries, to offset their oil costs and earn profit from valuable foreign exchange. There are also examples of agro-fuels providing clean energy and creating jobs locally. The sections below summarise what agro-fuels are and the debate around them, concluding with key points for further reflection.

What are agro-fuels?

Agro-fuels include a large spectrum of fuels produced from biomass[100]. Caritas uses the terminology "agro-fuels" rather than "bio-fuels" to avoid any confusion with organic agriculture ("bio" label).

First-generation agro-fuels:[101] ethanol is produced by fermenting and distilling plants containing sugar or starch (sugar cane, sugar beet, wheat or corn), and converting them into alcohol, which can be incorporated into gasoline, either directly or in the form of ETBE (Ethyl Tert-Butyl Ether). Diesel is derived from oilseeds (sunflower, soya bean, rapeseed, castor, jatropha, palm oil), whose oil is converted into Fatty-Acid Methyl Ester, which can be mixed directly into diesel. Pure Plant Oil (PPO) remains marginal. It is incorporated directly into diesel at varying percentages of vegetable oil (derived from oil seeds).

Second-generation agro-fuels[102] are not as widespread, but research is underway to enhance their productivity. They are based on chemical or biological processes that use the whole plant (stems and leaves as well as the grain), which are expected to enhance energy production per hectare and energy efficiency.

Third-generation agro-fuels[103] produced from algae, cellulose and waste without the need for land are also being explored. In these models, the use of biomass for energy production can be combined with other uses, such as pharmaceuticals and plastics, while energy production would probably come last in the "cascade".[104] The International Assessment of Agricultural Knowledge, Science and Technology for Development (IAASTD),[105] however, concludes that the next generation of agro-fuels are not yet commercially tested and their environmental and social effects are still uncertain.

Debating agro-fuels, defending food security

In recent years agro-fuels have been strongly supported in public policies all over the world. They have been presented as a way of limiting carbon emissions and energy dependence, but also as a source of employment and income particularly for developing countries. The EU even assumed that agro-fuel production would revitalise agriculture in various European countries and, until very recently, it has been committed to ensuring 10 percent of its fuel needs for road transport are through renewable energies (mainly, agro-fuels) by 2020.[106] Within a few years, agro-fuel production has grown massively. In 2008, close to 40 million ha of land worldwide were used for agro-fuel crops, a threefold increase since 2004 (13.8 million ha) and an

area corresponding to 2.3 percent of the world's entire agricultural land.[107] The G8 Summit of 2010 in Huntsville, Canada identified investment in "bio-energy" as the best means to move towards a low-carbon economy.[108]

However, producing agro-fuels is capital-intensive and energy-demanding, and requires large quantities of chemicals (herbicides, fertilisers, pesticides, fungicides), water and Genetically Modified Organisms (GMOs), especially in the case of corn and soya beans. First-generation agro-fuels directly compete with food production and hurt food prices. Large monoculture crops also require the appropriation of land plots traditionally owned by local communities, including indigenous people[109] (see below for land grabbing issues). According to some critical reviewers, existing agro-fuels only serve the interests of big agro-chemical companies, allowing them to spread their genetically engineered crops worldwide. Rather than hoping for second-generation agro-fuels, energy should be directed into improving existing solar, wind or conservation technologies.[110] Many voices (farmers' organisations, social movements, non-governmental organisations (NGOs), research institutes, governments and international agencies) have spoken against the negative consequences of agro-fuel production.[111, 112, 113] The food crisis of 2007–08 made the world reflect on them; in 2009, the FAO stated that the demand for agro-fuels was one of the causes of the food crisis.[114] The IAASTD concluded that the diversion of agricultural crops to fuel could raise food prices, make it more difficult to alleviate world hunger and badly affect small-scale farmers who would be marginalised or displaced from their land. From an environmental perspective, the IAASTD cast doubt on agro-fuels' net energy balance and GHG emissions mitigation.[115, 116] In 2010, the World Bank reported that the agro-fuel policies of the EU and the US aggravate land grabbing in developing countries, particularly in Africa.[117] According to the United Nations Environment Program (UNEP) *Water and Bioenergy Report*, the agricultural production of "organic" energy could, at current rates, jeopardise up to 36 percent of the world's arable land by 2030.[118]

A study commissioned by the EU Belgian Presidency[119] demonstrated that the EU 10-percent objective would be extremely damaging to food security and to the biodiversity and sustainability of agriculture in the world's South. An impact assessment of the renewable energy action plans adopted by the EU Member States,[120] showed that by 2020 the EU agro-fuel supply would depend on imports (about 50 percent for "bio"-ethanol and 41 percent for "bio"-diesel), requiring an agricultural area of 4.1 to 6.9 billion hectares. This massive production would cause large deforestation and higher carbon dioxide emissions. The assessment concluded that agro-fuels have a devastating impact on natural ecosystems and local communities.

Several UN food, development and trade organisations delivered a stinging report to the G20 Summit of 2011, warning that politically imposed mandates for the consumption of agro-fuels had inflated agricultural prices and contributed to their volatility.[121] The report recommended that G20 countries remove all existing subsidies and mandates for agro-fuel production or consumption. In October 2011, the FAO Committee on World Food Security (CFS) recommended reviewing "bio-fuels policies [...] according to [...] science-based assessments of the opportunities and challenges they may present for food security, so that bio-fuels can be produced where it is socially, economically and environmentally feasible to do so."[122]

Also the UN Special Rapporteur on the Right to Food concluded that agro-fuels negatively affect food security. First, because they cause significant increases in food prices, moving food out of the reach of poorer consumers and disadvantaging low-income, food-importing countries.[123, 124] Second, because agro-fuels compete for access to land and water, potentially reducing resources locally available for food crops, to the detriment of poor people.[125] And third, because agro-fuels are mostly produced by large-scale companies who buy or rent land in developing countries. Smallholder farmers play only a marginal role in this production and, whenever they are able to sell their surplus, their margin of profit is very little or none.[126]

Other experts[127] have pointed out that the whole cycle of production, distribution and use of agro-fuels, coupled with its direct and indirect effects on land, ultimately increases GHG emissions rather than mitigating global warming. Monoculture production harms biodiversity, which is essential for the diversity of food needed for adequate and nutritious diets. The socio-economic effects can be just as damaging: land conversion not only takes away land previously used as common property by local communities for the traditional supply of food, fodder and wood, it causes evictions, transforms rural living conditions and further marginalises smallholder farmers.[128]

Following these findings, in October 2012 the European Commission proposed to amend its Directive on the promotion of the use of energy from renewable sources in transportation[129] and to introduce a limit to the share of food-competing agro-fuels

Papua New Guinea: environmentally-friendly cash crops

The expansion of palm oil plantations in Papua New Guinea (PNG) has threatened natural resources and the livelihoods of local communities. In 2008–09 Caritas PNG launched a research and advocacy project to determine the full impact of palm oil plantations on the food security, livelihoods and future prospects of affected communities, particularly in the province of West New Britain where the largest palm oil plantation in the country – and the Pacific – is located. The report showed that most local landowners regretted selling or subleasing their land to palm oil companies as they received little economic benefit. They have seen land degradation associated with palm oil and waste in rivers, which kills fish and damages mangrove forests. Children contracted skin diseases from polluted rivers, while horticultural sprays caused asthma and other breathing problems.

The Diocese of Kimbe used the research as part of its awareness campaigns during village foot patrols as well as in its weekly radio broadcast to the entire province. As a result, other villages in Kimbe and particularly Kapo (home of the Kove tribe) decided to turn down offers from palm oil companies to expand into their area. The Diocese of Kimbe and Caritas PNG struggled to help local communities to look for alternative ways to earn a living, fearing that community leaders might succumb to the short-term economic incentives offered by the palm oil companies, given widespread poverty.

In 2010 Caritas Aotearoa New Zealand (CANZ) and Caritas PNG-Diocese of Kimbe set up a pilot income-generating project to grow cash crops such as cocoa and coconut as an alternative to the more destructive palm oil. People in Kapo planted 20,000 cocoa and coconut seedlings intercropped with taro, cassava, sweet potato and vegetables. These crops also provided extra food when King Tides flooded the island in March 2011. After hearing about climate change and the impact of palm oil plantations through Caritas' radio broadcasts, Kimbe's local government officials committed money and technical support to the project.

Important elements of the project included community consultation and planning, setting up and running women's groups and the staffs' technical skills and knowledge about cocoa farming. Diocese of Kimbe staff and Caritas PNG also identified and worked with local government representatives, government agencies and the private sector to get further technical and financial support.

towards existing renewable energy targets. The proposal aims at incentivising the production of advanced (third-generation) bio-fuels with low impacts on land use change and high GHG savings, which alone should be part of the EU's post-2020 renewable energy policy.[130] Conventional agro-fuels should stay within the 5-percent share of the overall 10 percent renewable energy target.[131]

Upon mandate of the FAO Committee on World Food Security (CFS), in 2012 the FAO High Level Panel of Experts (HLPE) began to analyse the effects of agro-fuels through an initial public consultation[132] and, in early 2013, sought views to change the current agro-fuel consumption targets and consequently adopt policies to limit their marketing.[133] The High Level Panel of Experts enquired into technical aspects of agro-fuels, their impact on hunger and poverty, as well as their social implications for poor people in urban and rural areas.[134] It highlighted that women – the "family anchor" for food security – have been the worst affected by the advance of large-scale agro-fuel investment.[135] It suggested that the impact of non-food competing fuel crops on food security should also be rigorously assessed, "since they also compete for land, water, labour, capital and other food-related inputs".[136]

Caritas has directly seen how agro-fuel production affects low-income countries, and demonstrated that reconverting and improving the quality of land to support sustainable agriculture and livelihoods is possible.

Towards a sustainable, poor-friendly bio-fuel[137] production?

The recent policy changes in the EU renewable energy system are to be welcomed. They prove decision makers are beginning to understand that false solutions to climate change such as agro-fuels may be extremely damaging to food security. But reducing consumption targets will not solve the problem, since the EU remains heavily dependent on imports from developing countries and the new provisions will not fundamentally change the global agricultural system. Moreover, the FAO High Level Panel of Experts has warned that agro-fuels will remain competitive in the face of persistently high oil prices.[138] In the short to medium term, therefore, the demand for agro-fuels is likely to increase in order to reduce dependency on fossil fuels. Low-income countries that are net oil

importers are clearly interested in the opportunity to offset these costly imports. Equally, countries with a comparative advantage in producing fuel crops have a high stake in the opportunity to earn profit from foreign exchange by selling them.

Since the mid-1970s, Brazil has been using ethanol as a substitute for oil. Between 2008 and 2012, ethanol is estimated to have saved Brazil $61 billion in avoided oil imports – the total amount of the Brazilian external public debt. However, large amounts of subsidies have been required to reach this stage. As the price of agro-diesels has been significantly higher than for fossil fuels – and is predicted to remain so for the years ahead – Brazil has developed plants that can alternate between sugar and ethanol production according to their relative prices, and has reduced ethanol blending during periods of high prices.

The FAO High Level Panel of Experts suggested adopting mechanisms to control the expansion of agro-fuel markets. It considered that a new generation of agro-fuels will not be available within this decade, and proposed looking at alternative policy measures to improve fuel efficiency and public transport, the sound assessment of non-food-competing fuel crops and, generally, a shift to a more comprehensive bio-energy policy approach.[139] While advocating for the phasing-out of agro-fuel subsidies in the future, Caritas calls for agro-fuel strategies to be fully integrated with food security and poverty reduction policies and consistent with governments' obligations under international law to respect, protect and fulfil the right to food. On a large scale, for example, it is possible to combine the production of food and fuel crops on the same land plot through mixed cropping and/or agrosilvopastoral systems,[140] or by transforming the by-products of one system into the inputs of another (especially feasible when combining food crops with livestock, fish farming and agro-fuels).[141] Generally, any future policy for agricultural expansion should prioritise food security and food production, with agro-fuel production as a secondary activity.

On a small scale, sustainable bio-fuels produced locally by smallholder farmers can create new sources of income and improve rural communities' access to energy.[142] It is in rural areas that energy poverty is the highest. A model of decentralised production and consumption of sustainable bio-fuels would best respond to this problem, presenting the additional advantage of situating the entire value chain in the local economy, thus maximising economic spill over.

Climate Resilient Eco-friendly Agriculture Mainstreaming (CREAM)

Smallholder farmers in many parts of Asia face drought, cold weather and flooding. Without government support to combat these problems, farmers are forced to replace traditional crops and practices with riskier interventions. This means traditional knowledge and agro-biodiversity is lost, and farmers are more vulnerable as they become dependent on aid including food and seeds. Other consequences include threats to cultural identity, the non-recognition of local food baskets in meeting nutritional security, land alienation, growing migration and above all, the lack of climate change adaptation and mitigation of traditional farming practices.

In the face of rising food prices, climate change and political instability, using eco-friendly agriculture to produce food locally is one of the best ways of securing a regular and nutritious supply of food. Because these problems are found at a local, national and regional level, it is important to work with smallholder farmer collectives and set up groups of stakeholders at different levels to foster informed debates and advocacy around these issues.

Caritas Asia developed the Climate Resilient Eco-friendly Agriculture Mainstreaming (CREAM) project to mainstream eco-friendly agriculture and create climate-resilient models in 13 Asian countries. The goal of the programme is to build climate-resilient, eco-friendly agriculture and an improved quality of life for 8,500 small farmers by the end of 2013. The project has two components: the first promotes sustainable agriculture, for example by organising demonstration plots, farmers' conferences, training workshops, farmers' learning exchange and cross-visits and publishing information. The second component is training and education in farmers' rights, which focuses on all rights related to the life, culture, tradition, practice and promotion of farmers' indigenous knowledge. This second component is strongly linked to advocating for farmers' rights to seeds and other agricultural resources, market access and advocacy against policies that negatively affect farmers and their agricultural systems.

The programme was implemented in three tiers at international, regional and national level.

One such example is the Cuiabá Biofuels Cooperative in Brazil, which has established a bio-diesel plant in Mato Grosso. Its objective is not to supply the national market, but rather to reduce the fuel costs of the cooperative's members, with estimated savings of up to 40 percent.[143] Bio-diesel in particular lends itself to small-scale agriculture, offering the possibility of meeting both transport and electricity generation needs in developing countries. The economic viability of oilseed production in small-scale agriculture is also shown by the performance of smallholdings in the Malaysian palm oil industry and the promotion of outgrower schemes[144] among bio-diesel companies such as D1 Oils.[145]

At household level in particular, small-scale bio-fuel production would be compatible with food production. A number of oilseed crops suitable for bio-diesel can benefit from intercropping with nitrogen-fixing leguminous vegetables such as beans, or can be part of more diversified farming strategies. Caritas should promote the opportunity for smallholder farmers to grow crops that help to achieve energy sufficiency, particularly if intercropped with staple crops they can eat and sell, and to organise themselves collectively. The "economia solidaria" model could be followed and adapted to other contexts, so that bio-fuel production could at once contribute to food security, environmental sustainability, social cohesion and community development.

Besides bio-fuels, other sources of bio-energy can be used to tackle energy poverty. Using biomass to produce bio-gas for heating and cooking is a great resource to address poverty among rural households, especially female-headed. While bio-gas can also be used to generate electricity, a number of NGOs in Africa (TaTEDO in Tanzania, Mali-Folkecenter, etc.) are experimenting in community projects involving multi-functional platforms – essentially adapted Lister diesel engines[146] with various attachments such as husking and grinding machines, oilseed presses and electric induction motors.[147] This enables communities to use unrefined jatropha oil as fuel for agriculture and electricity generation, in turn used to provide lighting, power and even pump water.

Again, the benefits may be particularly felt by women, whose living conditions can be measurably improved. The FAO High Level Panel of Experts policy orientations, proposing a shift to bio-energy as a development strategy, echo these considerations.[148]

B. Land tenure and water management

In Catholic Social Teaching (CST), the Earth belongs to God, who created and entrusted it to mankind to be shared by all.[149] People are the administrators and stewards of Creation, with a duty to care for Creation without dominating it.[150] God's ownership and mankind's responsibility for the Earth mean that no one has the right to dispossess a person of the land she or he is using, nor to arbitrarily possess it for their own advantage.[151] Land is a central part of Creation and must be considered as an opportunity to provide for, and honour the dignity of, the poor, the dispossessed, the stranger, the widow and orphan. This is why CST considers the concentration of land into one person's hands a scandal as this deprives parts of humanity from the enjoyment of the fruits of the Earth. Perverse inequalities and unjust individual and collective relationships generated by such concentrations are causes of social conflicts leading, among other things, to the degradation of the natural environment.[152]

While upholding the right to private property as an expression of human freedom, the principle of the universal destination of goods indicates the criterion for the productive use of land and, conversely, condemns the possession of large *latifundia*.[153, 154] This principle shapes our reflection on situations bearing serious ethical aspects and social consequences, such as the expulsion of farmers from land they have cultivated without ensuring they have enough to make a living, or the occupation of fallow land by extremely poor people who do not own it.[155] The universal destination of goods principle also defends common property, a traditional feature of many indigenous communities;[156] common property plays an important role in indigenous communities economic, cultural and political life, assuring their livelihood and well-being, while significantly contributing to the preservation of natural resources.[157]

Secure access to land, water and other natural resources is essential to attaining enough food for all. Due to insecure tenure of land ownership and use, farmers are often denied their right to food, water and other resources, dramatically increasing their risk of extreme poverty and hunger. Securing land rights provides a valuable safety net in times of hardship; farmers are more food secure and have increased household income through selling surpluses.[158]

In addition, land tenure influences the extent to which farmers decide to invest in their land. Farmers are more likely to improve soil quality, plant trees and improve pastures when they have secure tenure and can benefit from their investments and work.[159] Strong governance at national and local levels is needed to secure land tenure.

Legislation, administrative norms and implementation must provide for and protect the access and use of land and natural resources, allow for democratic participation, and ensure non-discrimination, transparency, accountability and the rule of law. Customary tenure and its potential in guaranteeing the sustainable use of common resources should be duly considered. Equitable and effective agrarian reforms also remain fundamental to enable farmers and farming communities to access the knowledge, technology, inputs and infrastructure that will lead to a steady improvement in land productivity and their own empowerment.[160]

On average, women farmers have fewer and weaker rights to land because of a bias in existing laws, customs and social roles. Preventing the exclusion of women from access to and control of rural land in Africa is one of the most significant steps that could be taken toward improving the livelihood of poor people in rural areas, although it is also one of the most challenging.

In Kenya, agriculture accounts for 65 percent of the country's total exports and provides more than 70 percent of informal employment in rural areas.[161] The sector remains the most effective way to drive inclusive economic growth among the poorest communities.[162] Legal mechanisms have been put in place to empower Kenyan women to fully partake in areas affecting their lives. One such area is in the agriculture sector. Article 40(1) of Kenya's new Constitution (2010), for example, gives women the right, either individually or in association with others, to acquire and own property.[163] Article 60 gives women the right to access, hold and manage land without any form of discrimination.[164] The implementation of the 2010 Constitution is one of the greatest affirmative actions seeking to empower Kenyan women. Although this represents a new dawn for the majority of Kenyan women,[165] in reality it is almost impossible for rural women to own or inherit land.[166] Most lack any formal education and there are no facilities in rural and remote areas to educate and inform local women farmers about their rights to land. Putting into practice the Constitutional pronouncements against discrimination, revising inheritance laws, exposing customary laws and traditional practices to scrutiny and redesign is not a simple task. Interventions fostering genuine change in the extent to which women control land must be directed at the multiple, interrelated institutions (political, legal, religious and social) that have established – and continue to reflect and reaffirm – the patriarchal ideology that dominates Africa's rural society.

Herding remains a very important source of livelihood in many regions, providing income security and export earnings for herders. In West Africa and parts of eastern and southern Africa, for example, the viability of this activity depends on herds being able to move about with reliable access to grazing reserves in the dry season. However, some States do not recognise grazing as a productive form of land use. Acknowledgement of pastoral grazing as a valid form of land use, thus giving rights to users, would better protect herders and prevent the conversion of grazing areas into cash crop fields.

Secure tenure is also instrumental in protecting land from degradation caused by environmental catastrophes. In a study of Typhoon Sendong, which struck the cities of Cagayan de Oro and Iligan in the Philippines in December 2011, the causes of the environmental and humanitarian catastrophe were identified as mainly manmade: forest denudation that had damaged watersheds, uncontrolled expansion of pineapple and banana export crops, mining operations carried out in the surrounding area, climate change and, not least, the government's failure to seriously address environmental disasters. In sum, extractive activities and extensive monocultures had plundered natural wealth, leaving people poor and exploited.[167]

While many farmers in the world do not have enough land to survive on, in recent years millions of hectares of agricultural land have been taken by large business investors. This "land grabbing" phenomenon is driven by the continuous global demand for natural resources including minerals; it happens in all continents, but 60 percent of land grabbing occurs in Africa.[168] Disguised as a way to foster economic development, land grabbing deprives local communities of the very resources they live on, causing poverty and social instability. Abundant land in Africa is claimed to be "empty" by governments, donors and investors; and yet, in reality, land is rarely left empty or unused. Local communities use it for pasture, hunting, fishing, collecting firewood, picking fruits, vegetables, honey, medical plants and even water. It also allows for soil regeneration. Land in Africa has historically been subject to "traditional" ownership and use that is, however, not documented, consequently this land is not recognised as legally owned. Governments are therefore the sole official owners of this "unused" land. It is on this basis, and as a consequence of absent or poorly implemented legislation, that they grant it to business investors, often with the support of international investment agencies.[169] This phenomenon has mainly occurred at the expense of local

Ethiopia: revitalising damaged land

Food is scarce for people living in Wukro woreda (district) in Ethiopia and all its 18 tabias (gathering of villages) have been included in the Ethiopian government's Productive Safety Net Programme. There is little rain – less than 450 mm a year – which falls within the space of only two months. As a result, torrential rain scoured a deep gully and with only a few trees and bushes to bind the earth together and allow the water to sink in, rain has washed away vital top soil – up to 3 percent of fertile land is affected each year. Land has been further damaged by overgrazing and local people cutting grass and felling trees. There is little training and few resources available to help local people tackle soil and water conservation.

In response, Caritas Spain and the Adigrat Catholic Secretariat (a local diocesan Caritas in Ethiopia) set up a project in 2010 to increase water availability and land productivity, avoid more erosion and reforest the area. Local people were trained in soil and water conservation and how to better use local resources. The gully has been stabilised, reducing the speed of the water that courses down it, thus decreasing soil erosion. The ground-water level has increased and with it there is more water for irrigation, which has improved soil stability. Reforestation of the area has also provided food for cattle. The local government has adopted the project as a "Cash for Work" programme as part of the government's Safety Net Programme.

Important elements of the project included actively seeking the participation of the community, and running awareness-raising campaigns on environmental degradation and climate change. It was also important to involve technical staff, to have financial support, and to have an understanding of the terrain of the area.

communities, smallholder and family farmers, whose rights to land and to food have been violated in this way without any reparation.

Extractive industries are also causing environmental damage and contributing to climate change. Toxic chemicals are released that poison soil and water in extended areas around extraction sites; mining demands large amounts of water, depriving farmers of access to water sources upstream, and polluting water downstream. Acidity penetrates the soil, while dust and toxins contaminate the air. Further effects are deforestation, destruction of biodiversity and erosion of topsoil.[170, 171]

Agro-fuel production is also a driver of land grabbing and, possibly, land concentration. In the period 2000–10, large-scale land acquisitions covered 58 million hectares, of which only 34 percent was for food crops, while the rest was for "flexible" or non-food production.[172, 173] A new form of land grabbing has been identified in attempts to mitigate climate change by State Parties of the Kyoto Protocol under the Clean Development Mechanism (CDM).[174] The governments of developed countries and the companies they authorise can purchase "Certified Emission Reductions" through financing emission-reduction projects in developing countries. Projects approved under the CDM have been criticised for damaging land rights, forests, water and ultimately the food security of local communities. The CDM projects include industrial tree and agro-fuel plantations on land claimed to be "marginal"[175] and have tended to mitigate the effects of industrial operations in richer developing countries, rather than delivering sustainable development.[176]

The problems connected to land tenure (such as intensified cultivation due to growing food demand, urban expansion, climate change, soil degradation, forced displacements, privatisation and unlawful land grabbing) were addressed by the FAO Committee on World Food Security (CFS) at its 38th session on 11 May 2012, with the adoption of the *Voluntary Guidelines on Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security*.[177] These guidelines set out principles of participation, accountability, non-discrimination, transparency, human dignity, equity between men and women, empowerment and the rule of law.[178] They set a framework for States to develop strategies, legislation and policies[179], but can also be used by the private sector and civil society as a lens for assessing the legitimacy and appropriateness of such policies or other practices.[180] The guidelines uphold the centrality of land to development; eradication of hunger and poverty and the sustainable use of the environment depend largely on access to land, fishing and forestry.

Of particular interest is Part 6, addressing land tenure in the context of climate change, natural disasters and conflicts. It states that legitimate tenure rights should be respected and protected in laws, policies and actions aimed at preventing and responding to climate change.[181] States should consult the people who are

displaced by the effects of climate change when they devise strategies to help them. Provisions for alternative settlements should not jeopardise the livelihoods of others.[182] Mitigation and adaptation programmes should involve the participation of all legitimate rights-holders, in particular small-scale food producers and vulnerable people.[183] Disaster risk preparedness programmes should address tenure issues, including information and recording systems.[184] Being voluntary, the guidelines do not impose binding obligations on States or their local levels of government. Their authoritative force, however, makes them an international reference that organisations like Caritas should promote and advocate.

Water scarcity is already a scourge of the poor; it is difficult to calculate the exact number of people affected. The FAO estimates that, by 2025, 1.8 billion people will be living in countries or regions with absolute water scarcity, and two thirds of the world's population could experience water shortages.[185] Climate change will aggravate these projections, particularly in sub-tropical regions, because of more frequent droughts, evaporation and changes in rainfall patterns. Precipitation is expected to increase and rainfall to become more intense in some regions, threatening human settlements. Changes in temperature, precipitation and climatic extremes will add further pressure on agricultural resources.[186] Malawi, for example, is classed as a water-stressed country with less than 1,700m^3 of freshwater available per capita per year. Irrigated food production is reducing as an effect of climate change and conflicts over access to water are increasing. Climate change and declining rainfalls, compounded by deforestation and degradation, affect the ground water recharge and cause increasingly more wells to dry up. People's access to clean and safe water is undermined, as many resort to drinking or collecting water for household use from unprotected sources like rivers, lakes or streams.[187]

In West Africa's Sahel, a food crisis arose, and continues to evolve, in a context of climate change; the region's economy is predominantly agricultural, with a large amount of cattle breeding, both employing more than 80 percent of the working population. All economic activity is, therefore, heavily dependent on climate predictability.[188] Climate change trends include higher temperatures, sea-level rises, less precipitation and more droughts, with significant impacts on water reserves, agriculture, breeding, food security and human health. Fewer water resources will lead to more conflicts, permanent food insecurity and increased urbanisation.[189]

Access to safe drinking water and sanitation is a human right, defined by the UN as the right to equal and non-discriminatory access to a sufficient amount of safe drinking water for personal and domestic use to sustain life and health. This right should be duly implemented and States should prioritise personal and domestic water use and take steps to ensure that water is of good quality, acceptable, affordable for all and can be collected within a reasonable distance from a person's home.[190] A human rights approach to water and sanitation also requires explicit attention to the most disadvantaged and marginalised while ensuring participation, empowerment, accountability and transparency.[191] In view of the above, water management frameworks that ensure sustainable use of

Green shoots after drought

In the summer of 2011, millions of people in Ethiopia, Kenya and nearby countries suffered their worst drought in 60 years. After crops dried up and livestock died, hunger became widespread. Malnourished children and elderly people were in particular danger.

To help people cope with unreliable rains, Caritas Kenya built water tanks to store water for the dry season and provided local communities with drought-resilient seeds such as sorghum, millet, cowpeas and pigeon peas. Caritas also offered training and technical help on environmental conservation techniques, such as building terraces to conserve scarce water and topsoil. A dam, which was built by the community who were paid for their work, was enlarged to provide more water during the dry season. The idea behind Caritas's "food/cash for work" was to have members of the community working together towards a common goal. Caritas reported "as they work together, they realise that they tend to achieve more and therefore live in harmony".

These projects helped tackle acute malnutrition in young children, and they significantly reduced the time that women spent looking for water. An underlying idea in all the projects was to change the attitude of people towards humanitarian assistance. Instead of people becoming dependent on aid, Caritas strived to provide people with the skills and resources to become self-reliant.

water must be adopted urgently, so as to preserve ecosystems, prevent and punish misappropriation and over-exploitation of resources, and ensure equitable access to adequate and safe water for all.[192, 193]

C. The impact of climate change on global agricultural trade

International trade, if soundly governed and directed to the common good, has great potential to reduce poverty worldwide and become the economic driver of sustainable growth.[194] A one-percent increase in developing countries' share of world exports would lift 128 million people out of poverty.[195] So far, trade has also been an important factor in food security, as many developing countries rely on exporting raw materials to earn foreign exchange and pay for importing food. However it is clear that trade in agricultural products is also heavily dependent on weather conditions and, in the long run, on climatic trends. FAO statistics for cereal production, for example, revealed a contraction of 5.7 percent in wheat production and of 2.6 percent in coarse grain in 2012. Adversely dry conditions predicted for 2013 were reported to hamper production prospects in the US and the Russian Federation, while wet conditions would have threatened field yields in the EU.[196] Lower wheat exports expected for 2012/13 from the US, due to drought, would have increased the value of stocks and driven prices upwards. A similar trend was observed in international maize prices, due to adverse weather conditions affecting the 2013 maize crop in South America. In low-income net food-importing countries, although cereal production is projected to increase slightly due to favourable weather conditions in western Africa, the total cereal imports for 2012/13 remain above the previous five-year average.[197] The food import bill of low-income, net food-importing countries would further increase due to higher cereal prices.[198]

The net balance of Africa, the continent most heavily dependent on food imports, is predicted to stay in deficit in spite of improvements in some place. International food prices remain high and are only cushioned by government subsidies on staple foods in some countries.[199] This raises concerns for low-income African countries: their vulnerability to fluctuations in international food prices can have serious negative effects on hunger and poverty. Food insecurity has already hit worrying peaks in some parts of Africa. In the Sahel, the consequences of the food crisis require long-term income generation and asset reconstruction to protect livelihoods. In countries like Mali (where conflict and the massive displacement of people have seriously disrupted trade), Central Africa (where persisting civil insecurity impedes agricultural recovery and humanitarian efforts, and where recent widespread floods have exacerbated the situation), the Democratic Republic of Congo, conflict-affected areas in southern Somalia and flood-affected areas of South Sudan.[200]

Kenya: seed fairs and zai-pits tackle drought

Caritas Kenya has been working with 1,000 people in the drought-prone area of Igembe in eastern Kenya, where local communities struggle to grow enough food and find safe drinking water. With no seeds to plant because of drought, Caritas organised seed fairs before the onset of rains, so farmers could obtain local seed varieties. To increase farm productivity, Caritas trained people to build terraces and zai-pits – where seeds are sown into small pits filled with compost and manure – as an alternative to kitchen gardens, further promoting the concept of organic farming. Using this new technique, farmers were able to produce household crops like onions and green vegetables.

The local community also helped to build and improve underground water storage tanks, making safe drinking water easier to store and collect. Many institutions have already approached Caritas Meru and the contracted engineer to construct similar tanks in their area.

Caritas staff managed to head off potential problems. Many families who were not originally part of the project came to seed fairs hoping to obtain seeds; fortunately enough local seed was available and Caritas staff identified another 800 suitable families who were keen to be trained and to build zai-pits. Poor roads made it difficult for seed vendors to visit local communities, so seed fairs were held on market days to allow families to attend both on the same day. Caritas hired vehicles to help distribute seedlings and vines.

Insecurity in the region remained high during the lifespan of the project and many families migrated to safer areas. Constant peace-building activities and involvement of government security agents helped reduce the rising tensions, but this still remained a major impediment to the smooth running of the project.

Meanwhile, Asian countries are becoming strong exporters, with cereal harvests at record levels in 2012 (especially in China, Indonesia, the Philippines, Thailand and Vietnam) due to the availability of subsidised input. China's largest export record reflects strong public support for the cereal sector.[201] These developments reflect the general trend in favour of increasing South–South trade flows, while traditional North–South trade is losing its dominance. China and India (where approximately one third of the world population live) are expected to play a key role on the demand side in the global food market, due to an increase in their consumption of meat and higher quality processed food.

However, as demonstrated by the latest harvests in weather-affected Asian countries like India, where the late monsoon and a prolonged summer dry spell caused a lower rice crop, and South Korea, where several typhoons damaged the paddy harvest, climate change is one of the constraints faced by the global food system. In Australia (where the country's western region was hit by severe drought and the eastern areas received heavy rains too late in November), wheat crops are estimated to have dropped by 25 percent from 2011.[202] Generalised loss of soil moisture worldwide suggests that regions with a great deal of farming potential, like Brazil, southern Africa and India, may not have the capacity for more food production as the world is on the way to warm by 4–5°C by the end of the century.[203]

The decline in harvests caused by climate change is today compounded with other challenges. They include population growth and the consequent increasing demand for food; competition for land between food and fuel industries; water scarcity; and food price volatility due to the correlation between oil prices and the price of agricultural products on the one hand, and financial speculation on the other.[204] In the face of all these concurrent, yet conflicting challenges, trade alone is not a lasting solution to re-establish food security in food-insecure areas. Not only is trade an insufficient response to shocks, but often the way governments react to supply disruptions strongly influences food price volatility. A panicked reaction to the food price crisis in 2008 is an example of how – in response to an international food emergency such as one that climate change could generate in the future – trade measures can be used in ways that exacerbate food insecurity, such as export bans to protect the domestic availability of food. Protectionism, however, is a short-sighted strategy for controlling food prices and has a range of unintended consequences for the domestic and international economy. In the summer of 2010, for instance, Russia experienced a heat wave with the highest recorded temperatures in 130 years. As news of the disaster spread, and the resultant drop in Russia's grain production became known, international grain prices increased dramatically. As a response, and in an effort to protect local consumers and meat producers, the Russian government imposed a grain export ban that pushed grain prices even higher on the international markets. In the end, the ban did not bring food prices down in Russia, it increased the price of grain internationally and contributed to price spikes and general instability in the market.[205]

In view of the above, a whole blend of coordinated policy responses is needed.[206] Among these, a radical shift from conventional, industrial agriculture towards more sustainable food production systems favouring small-scale food producers has been advocated by most NGOs and some intergovernmental agencies.[207] Such a model will need in place beneficial trade rules and macroeconomic policies.[208]

In fact, 75 percent of the world's poor and undernourished people are located in rural areas and depend on agriculture directly or indirectly for their livelihoods. Five hundred million smallholder farmers worldwide are supporting around two billion people, or one third of humanity. Extensive research and persuasive evidence demonstrate that increasing smallholder farmers' ability to produce food and get it to market will not only improve their purchasing power but also increase food availability and so contribute to global food security. Caritas supports this view while being fully aware of the arguments advanced to challenge it.

Growing investor interest in Africa has triggered a debate over the relative advantages and disadvantages in Africa and, worldwide, of large-scale versus small-scale farming models. The debate was further stimulated by the development economist Paul Collier,[209] who argued that shifting the focus to smallholders might actually hinder wide-ranging poverty reduction, and that current policies ignore one essential factor for labour/productivity growth: successful migration out of agriculture and rural areas. According to Collier, the international food system and agricultural production technology have changed in favour of larger-scale ventures, which facilitate commercialisation. But this can be contested by considering the merits of diversifying local economies and, on the other hand, by considering the effects of "rampant" urbanisation brought about by migration.

One of the features adopted by large companies to conduct agri-business is

Bangladesh: breeding better seeds

To have good harvests and a regular supply of food, farmers need a reliable source of high quality seeds suited to local conditions. Through Farmers' Lead Approach, Caritas Bangladesh has helped farmers become more professional in seed breeding to create new, more resilient and productive seed varieties.

Mrs Renuka Chiran is one of the lead farmers. As well as growing food for her family, her farm is a demonstration farm. Along with another farmer, Mrs Chiran trains her fellow farmers in community-based scientific seed breeding, to produce improved local seeds which have a higher yield, are better adapted to the local area, and are suitable for organic farming. She also shows them how to produce and use organic fertilisers made out of locally available ingredients, such as fish waste, butter milk, coconut milk, and fruits such as papaya and banana.

In addition to the Farmers' Lead approach, Caritas Bangladesh also supports community seed banks where superior quality seeds are stored in mud jars, paddy straw and banana leaves. Having seen the results at demonstration farms such as Mrs Chiran's, farmers choose seeds they want to sow on their farms. After a successful harvest, farmers return to the seed bank twice the amount of seeds they used, so they can be distributed to other farmers.

The project not only enables people to grow more food through adaptation techniques, it also encourages women to partake and become leaders in their communities.

"out-grower schemes", based on supply agreements between farmers and buyers. Usually, smallholder farmers grow and deliver agricultural produce of a specified quantity and quality at an agreed date. In exchange, the company agrees to provide up-front inputs, such as credit, seeds, fertilisers, pesticides and technical advice, all of which may be charged against the final purchase price. The scheme could be seen as a way of assuring a market for farmers, and assuring quality and quantity of supply for buyers. Theoretically, the arrangement should reduce the risk for both parties. However, in practice the negotiating power of large-scale investors on one side, and farmers and farmers' organisations on the other, means that negotiated terms usually discriminate against smallholders. Out-grower schemes can, in fact, create an exploitative relationship where smallholders provide cheap labour and are expected to carry all production risks. Better-resourced farmers may capture the contracts, while poorer farmers work as labour on the contracted farms. Unforeseen drawbacks include delayed payments for the produce, provision of faulty seeds, lack of formal contracts and non-delivery of technical assistance. Experience has shown the additional risk that, in the long run, land access may shift from women to men, who are more likely to sign contracts for cash crops with agri-business. Shifts in land access may also favour local elites that are better positioned to profit from new market opportunities created by out-grower schemes.

Investing in one model only – small-scale rather than large-scale production models – or "Low External Input (LEI)" versus "High External Input (HEI)" agriculture is not the answer because the two models may in fact complement each other. Achieving food security while at the same time protecting the environment means adopting a combination of policies, a four-pronged approach aimed at:

- Helping subsistence farmers to cope with risks and become less vulnerable;
- Supporting small-scale investor farmers with the necessary skills, knowledge, credit and entitlements;[210]
- Regulating food trade and investment through policy frameworks that fulfil the right to food for everyone, in particular poor people;
- Building on complementarities between large-scale and small-scale farming models as much as possible.[211]

One strategy to cope with adverse weather conditions is genetic engineering and GMOs resistant to climate shocks. The genetic improvement of crop varieties and livestock species has been highly valued by some for its considerable potential for climate change mitigation (notably methane emissions) and adaptation (in particular to cope with drought and water scarcity), and, as argued by some, for food security too. However, like many innovations, it also presents serious drawbacks and requires caution. Agricultural bio-technology has the potential to enhance productivity, yield stability and environmental sustainability. Maize yields in the developed world average more than 8 tonnes per hectare while those in the developing world are barely more than 3 tonnes per hectare, reflecting the gap in farming technologies. In developing countries, more than 50 percent of the total area allocated to maize is sown with traditional low-yielding varieties, which leads

to lower harvests. Thus limited access to appropriate technologies hinders agricultural growth in developing countries. Such disparities are aggravated by the fact that most GMO-related research, bio-patents and investment are in the hands of a few agri-business companies.[212] This commercial constraint seriously limits effective access to bio-technology, as large segments of smallholder farmers cannot afford it. GM crops also generally need more expensive chemical herbicides and insecticides.[213] For bio-technology to be mainstreamed in the transition to sustainable agriculture, more public investment is needed in this area to allow small-scale farmers to benefit. At the same time, since bio-technology also presents potential risks for human health and the loss of bio-diversity (largely not controllable at the present stage of research), public policies must be based on serious risk-assessment and regulate these technologies in ways that are cost effective and that address legitimate public concerns.[214]

However, lower productivity may induce better soil adaptation, less risk, less dependence on external inputs and higher biodiversity: all of these factors should be seriously considered in introducing improved varieties, due to the potential benefits on the livelihoods of the poorest farmers in particular. As the history of the "green revolution" demonstrates, an improvement in yield is often associated with pollution due to abuse of pesticides, a concentration of land in the hands of the few and corresponding landlessness for others, and increased debt leading to poverty and other social issues. Caritas is especially concerned about poor farmers becoming dependent on agri-business for producing and cultivating seeds,[215, 216] concerns exacerbated by the fact that GMOs do not address the root causes of hunger.

Caritas organisations have been responding to climate challenge by pursuing adaptation projects in many countries, especially those most prone to drought, to enable farmers to obtain higher and steadier yields from their land.

Mexico: tackling natural disasters with traditional farming

In 2010, torrential rain from Tropical Storm Matthew triggered flooding and mudslides in the Chiapas region of Mexico, damaging local communities' land and crops. The following year, Caritas Mexico began working with local people to restart maize and bean production using "milpa", an ancient crop-growing system used in Mesoamerica. Caritas provided materials and trained a number of men and women as community workers on the conservation and restoration of soil and seeds, including training on the basic principles of disaster risk reduction. In turn these community workers, along with technical staff, gave workshops and in situ demonstrations to a total of 91 communities in nine different municipalities.

Among the various challenges was an agreement signed by the government with a giant agribusiness company for a one million dollar investment in maize production. Local people feared the genetic diversity of local maize would be lost and that they would also lose control over the means and process of production. They felt that industrial agriculture was ravaging natural resources, replacing community wealth and knowledge with industrial inputs, and taking local and indigenous people's land. Other challenges to the project were the rising costs of products in emergency situations and the global financial speculation.

The project saw local famers adopting the traditional milpa system, using organic fertilisers and insecticides, resulting in better yields and more food for families. It demonstrates that projects based on "economia solidaria" (solidarity economy) are a good way to counter the "market" generated by food emergencies. People understood that the use of agro-chemicals depletes the soil and that much attention must be given to the use of GMOs.

D. Governance and shared responsibility

Weak governance impairs social stability, environmental sustainability, development and economic growth.[217] Human rights, including the right to food and to a healthy environment, would be devoid of substance in the absence of effective guarantees, for example because of corrupt practices or inadequate implementation. In a human rights-based food security system, States bear clear responsibilities complemented by the role of other stakeholders. Food security then is the outcome of a process informed by the principles of democracy, participation, transparency, shared responsibility, accountability and the rule of law. In such a process, individuals and communities concerned would exercise their right to take part in public life, to freedom of expression and to seek, receive

and impart information, especially in decision-making processes relating to the right to food, with special attention to the poorest and most vulnerable people who are often excluded from such processes. Under a human rights-based approach, people would stop simply being "recipients" of public policies and become agents of the human development process, and hold their governments accountable for the consequences of their decisions.[218]

In Caritas' experience, food security cannot be guaranteed if States at a national, regional and local level fail to put sound governance principles into practice. Such failures are even more exposed in times of climate-induced disasters. The FAO *Voluntary Guidelines to Support the Progressive Realization of the Right to Adequate Food in the Context of National Food Security* give a prominent place to democracy and good governance as conditions of an enabling environment for the fulfilment of the right to food. Good governance is essential to empower people and civil society to bring their claims to governments, to participate in policy-making that addresses their needs and to ensure transparency and institutional accountability.[219] Good governance is also described as "an essential factor for sustained economic growth, sustainable development, poverty and hunger eradication".[220] In this context, while States bear the primary responsibility for the realisation of the right to food, a multi-stakeholder approach is key to identify roles and responsibilities, to bring together expertise and to allow for the efficient use of resources.[221] Partnership and coordination among States, international organisations, the private sector, civil society (including farmers' organisations) and other stakeholders are essential to strengthen policies, programme planning and capacity development.[222]

The FAO High Level Panel of Experts (HLPE) addressed the need to strengthen good governance in policies and programmes that address food security and climate change.[223] It also recognised the need to coordinate many different stakeholders, including farmers, and has recommended first debating and reviewing public-private partnerships to address the controversy surrounding the changing role of public and private sectors. Affected communities should be allowed to take part in the process and be properly informed about risks. The role of civil society is considered critical, given its multiple functions of monitor, integrator and institutional innovator. Special focus is put on women as agricultural decision-makers and integral to the design and implementation of policies and programmes tackling climate change challenges to food.[224] All public decisions about adaptation and mitigation policies and programmes must be transparent to increase efficiency and equity, while the participation of farmers, fishing communities, foresters and civil society gives them an integral and expert voice on design that encourages the efficient use of resources. All stakeholders, thus, must be given a voice in the process.[225]

Caritas organisations reaffirm their commitment to advocate for open participatory processes at all levels, to ensure that people and communities are effectively consulted, as well as for really accessible monitoring channels, due reporting and means of recourse for accountability. Unfortunately, this is not yet a reality in many countries.

Participation: the way to a pro-poor climate change policy in Malawi

While the Government was developing a National Climate Change Policy, CADECOM (Caritas Malawi) began consulting people in rural areas on climate change, disaster risk reduction and poverty in their country, and encouraged them to submit recommendations. This gave poor people the unique opportunity to influence policy-making. People in the eight dioceses of Malawi took part in focus group discussions, interviews, "look, learn and listen" sessions, and sometimes disaster mapping and analysis. CADECOM then produced a national report based on all of the information gathered. Issues highlighted as being particularly problematic included the impact of climate change and disasters on women, infrastructure development such as roads, and selling livestock or casual labour as survival techniques. Community-based adaptation techniques were also discussed, like small-scale irrigation, crop diversification, conservation agriculture, tree planting, and especially the Village Saving and Loan scheme pioneered by CADECOM.

Key recommendations included more involvement of community groups in climate change decision-making and implementation, as well as improving the knowledge and skills of local councils, greater policy coherence and better dissemination of information on climate change at all levels.

At the international level, the reformed FAO Committee on World Food Security (CFS) represents an important achievement, allowing for the participation of numerous small-scale food-producer and civil society organisations. The CSF is the most inclusive forum for the global governance of food security and nutrition policies, applying an effective participation methodology, based on the principle "one member, one voice", to its decision-making.[226] In October 2012 it endorsed the first version of the *Global Strategic Framework for Food Security and Nutrition* (GSF), a single reference document that recommended improving policy convergence and coordinated action among a wide range of stakeholders. The Global Strategic Framework includes a global peer review mechanism and will articulate Committee on World Food Security (CSF) activities, as well as the monitoring and implementation of the right to food. Although not binding, the Global Strategic Framework fosters effective partnership for global, regional and national plans to prevent future food crises, eliminate hunger and ensure food security and nutrition for all.[227] However, nothing of this kind exists in other bodies such as the G8, the G20, the World Trade Organisation and, especially, the UNFCCC Conference of the Parties, which have an enormous impact on food security. This democratic gap is something Caritas will have to always consider in its future advocacy.

Costa Rica: Roundtable for Food Security

During the 1980s Costa Rica adopted a series of policies that dramatically changed the role of agriculture in the country. When the 2008 international food crisis hit, the government began to review its agricultural policies, giving farmers' organisations a new opportunity to fight for farmer-friendly policies. Pastoral Social Caritas Costa Rica was also anxious to engage in the debate and gathered together representatives of the best-known farmers' unions in the country to hear their views on the food crisis. When farmers asked Caritas to help them draft a submission on farmer-friendly food security policies, Caritas organised a series of meetings between June 2008 and November 2011 with a range of organisations in the agricultural sector and beyond. The fruits of this collaboration included a draft of key policy recommendations on food security and food sovereignty, as well as meetings with key government and industry officials.

Caritas then brokered discussions on food security and food policies between the government and farmer leaders in one province. It also helped set up discussions between government officials and bean producer leaders to explore improved marketing for their product.

Many lessons can be drawn from this experience. First, Caritas found that advocacy in partnership with others is more effective than working alone. Second, staff realised that they could not move faster than the organisations they support, which must be allowed to move at their own pace. Finally, it is important for Caritas to remain impartial so as to not lose credibility as a coordinator and host organisation, especially when differences of opinion or tensions arise among member organisations.

This experience demonstrates the value of bringing together different groups to work on public policy issues. Caritas member organisations can provide meeting spaces, coordination and leadership on consensus-building for organisations that are otherwise unable to come together around a common goal. It is also important to share knowledge on food security between different groups, including academics. Local and national governments could also learn from these Church- and Caritas-led initiatives, to build consensus and social cohesion on such issues.

Conclusion

Providing food for the hungry is a priority for the work of Caritas. The human right to food is essential for the realisation of many other human rights and must be at the core of sustainable food security strategies. Denying access to food to the poorest and most vulnerable people is an offence to human dignity, creates social inequalities and hinders human development. Food insecurity and hunger are rooted in poverty and exacerbated by degradation caused by environmental, human and political factors.

Hunger is today's most pressing challenge and climate change is arguably the greatest global constraint to combating it. Climate change does not only affect the environment, but also global trade, economic growth, poverty and social cohesion, human health and security. It affects a wide range of human rights. Among the gravest consequences is the forced migration of millions of people because their land is no longer inhabitable or suitable for agriculture.

The contemporary industrial model of food production, distribution and consumption causes environmental damage and accelerates climate change. The misuse of natural resources like land, water, minerals and food crops aggravates these effects, causing people to lose their land, be driven into poverty and socially excluded.

Tackling the effects of climate change on food security requires a combination of policy solutions, convergent and organised according to good governance. Sustainable agriculture, rural development (including the empowerment of rural women), sound agrarian reforms, access to food markets, climate and human rights-friendly energy policies are some key facets of a comprehensive policy response to the challenges posed by climate change to food security.

Today it is not only governments who are responsible for countering climate change; it is also the responsibility of a wide range of groups (including the private sector), each with a unique role in the fight for integral human development. Serious political will is required for this endeavour; when such a will is there, coordination, capacity building and effectiveness are possible. Regrettably, neither the "Rio+20" Conference in 2012 nor the last UN climate summits have adequately demonstrated political will to effect change. This shows that governments cannot discharge their ultimate responsibility to act as guarantors for the common good.

The objective of ensuring food security for all is, ultimately, part of an overall vision where human well being is paramount. For Caritas, integral human development must be the goal of sustainable development strategies encompassing climate policies, education, empowerment, and food sovereignty at large. Both short- and long-term interventions in favour of food security must therefore aim at the integral development of everyone.

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Notes

1 842 million people are reported to have been undernourished between 2011 and 2013, while between 30 percent and 50 percent of food produced is wasted. "Global food: Waste not, want not", Institution of Mechanical Engineers, 2013, at http://www.imeche.org/knowledge/policy/reports.
In Europe and North America, per capita food waste ranges between 95 and 115kg a year, compared to only 6–11kg a year in sub-Saharan Africa and South and Southeast Asia: Food and Agriculture Organization of the United Nations (FAO), "Global food losses and food waste – Extent, causes and prevention", May 2011. http://www.fao.org/docrep/014/mb060e/mb060e00.pdf

2 "(…) Hunger threatens not only people's lives but also their dignity. A serious and protracted lack of food breaks down the organism, generating apathy, a loss of a social sense, and indifference or even cruelty towards those who are weaker – particularly children and the elderly. Whole groups of people are then condemned to waste away to death." Pontifical Council Cor Unum, "World Hunger – A Challenge for All: Development in Solidarity", 1996, para. 5.

3 Vocabulaire de théologie biblique, Food, p. 838.

4 Source: FAO, 2012

5 Dictionnaire biblique, meals, pp 631–632

6 Compendium of the Social Doctrine of the Church, No. 195.

7 Caritas in Veritate, para. 27.

8 Renew the Earth, Section 4, para. C.

9 Universal Declaration of Human Rights, Article 25(1). Document available in 409 languages at http://www.ohchr.org/EN/UDHR/Pages/Introduction.aspx

10 International Covenant on Economic, Social and Cultural Rights, Article 11(1 and 2), at http://www.ohchr.org/Documents/ProfessionalInterest/cescr.pdf

11 Article 12, at http://www.oas.org/en/iachr/mandate/Basics/sansalvador.asp

12 General Comment, no. 12, paras. 8–10, in Columbia Law School – Human Rights Institute and Heinrich Böll Stiftung, "Climate Change and the Right to Food – A Comprehensive Study" (hence "Climate Change and the Right to Food"), Ecology Volume 8, 2009, p. 43.

13 General Comment, no. 12, para. 7.

14 General Comment, no. 12, paras. 14–15.

15 'Climate Change and the Right to Food', note 12 above, p. 44.

16 UN Special Rapporteur on the Right to Food, "Building Resilience: a Human Rights Framework for World Food and Nutrition Security", UN Doc A/HRC/9 /23, 2008, in "Climate Change and the Right to Food", p. 45.

17 "Climate Change and the Right to Food", p. 44.

18 Food and Agriculture Organization of the United Nations, Rome 2005.

19 http://www.fao.org/righttofood/index_en.htm

20 Optional Protocol to the International Covenant on Economic, Social and Cultural Rights, adopted by the UN General Assembly on 10 December 2008 by resolution A/RES/63/117 and opened for signature on 24 September 2009.

21 Three months after the deposit of the tenth instrument of ratification or accession, as foreseen by its Article 18, para 1. On 5 February 2013, Uruguay was the tenth country to make such a deposit. http://treaties.un.org/P.s/ViewDetails.aspx?src=TREATY&mtdsg_no=IV-3-a&chapter=4&lang=en

22 Optional Protocol, Article 2.

23 Statement by the UN Assistant Secretary General M. Simonovic on the occasion of the deposit of the tenth instrument of ratification of the Optional Protocol, at http://www2.ohchr.org/english/bodies/cescr/index.htm

24 Optional Protocol, Articles 11 and 12.

25 Article 10.

26 See the Caritas Demands for a Future Without Hunger, International Congress on Global Hunger and Food Security, Vienna, 1–2 June 2012, at www.zukunft-ohne-hunger.at

27 Goal No 1 of the UN Millennium Development Goals is to "Eradicate extreme poverty and hunger". Target 1.C aims to halve the proportion of people who suffer from hunger, between 1990 and 2015. In 2005, 1.4 billion people were living on less than $1.25 per day, according to the UN Millennium Development Goals Report 2011, 6. Between 2011 and 2013, 842 million people in the world were undernourished according to the FAO, "The State of Food Insecurity in the World", at http://www.fao.org/publications/sofi/en/

28 As stated by the World Food Summit,1996. This definition was strengthened, slightly but positively, with the notion of "social access" in FAO, *The state of Food Insecurity in the World 2001*, Rome 2001, p. 49. http://www.fao.org/docrep/003/y1500e/y1500e06.htm#P0_0

29 Also endorsed by Caritas organisations, see for example Caritas Austria, "A Future without Hunger – Causes, effects and countermeasures", 2012, p. 4.

30 These debates were illuminated by the analysis of the Nobel Prize winner Amartya Sen's "Poverty and Famines". The notions of household and individual food security were around in the early 1990s. Brot fur die Welt, Diakonie Katastrophenhilfe and Germanwatch, "Climate Change, Food Security and the Right to Adequate Food", Brot fur die Welt, Diakonie Katastrophenhilfe and Germanwatch, 2008, p. 42.

31 "Food Security", Policy Brief, Food and Agriculture Organization (FAO), June 2006, Issue 2.

32 See Brot fur die Welt *et al*, p. 44.

33 African Development Bank, Asian Development Bank, European Commission, OECD, UNDP, UNEP, The World Bank *et al*, "Poverty and Climate Change – Reducing the Vulnerability of the Poor through Adaptation", 2007, p. 38.

34 http://www.adaptation-fund.org/system/files/AFB.B.11.5.Initial%20Funding%20Priorities.final_.pdf

35 Definition drawn from "FAO-Adapt/Framework Programme on Climate Change Adaptation", FAO 2011 (based on FAO climate change glossary, IPCC Assessment Reports of 2001 and 2007a, and other publications of intergovernmental organizations), as well as from "Securite alimentaire au Sahel", presented by HE Mgr Paul Ouedraogo, President of OCADES Caritas Burkina at the UN Conference on Sustainable Development, June 2012.

36 OCADES Caritas Burkina, "Securite alimentaire au Sahel".

37 It describes itself as "an international movement which coordinates peasant organizations of small and middle-scale producers, agricultural workers, rural women, and indigenous communities from Asia, Africa, America, and Europe".

38 Nyéléni Declaration, 2007.

39 J. Ziegler, "Report of the Special Rapporteur on the right to food", Human Rights Council, Seventh session, Agenda item 3, New York, UN, 2008, para. 74.

40 Inaugurated on 28 January 1979.

41 Conference of Aparecida, 2007.

42 Aparecida, 65.

43 Large land holdings, often belonging to absentee owners where the land is worked by hired labour and land resources are often also under-used. Southern African Catholic Bishops' Conference, Justice and Peace Department, "Catholic Church Vision for Land Reform in South Africa", January 2012, p 4.

44 Aparecida, 471.

45 Agroforestry includes both traditional and modern land-use where trees are managed together with crops and/or animal production in farms. See http://www.fao.org/forestry/9469/en/

46 H Hanashiro *et al*, Caritas del Peru, "Cambio climatico y soberania alimentaria en America Latina y el Caribe", 12 April 2011. Working document, available on request.

47 Caritas Australia, "Climate Change Frequently Asked Questions", "A just climate: Change your footprint – take a stand" campaign at http://www.caritas.org.au/act/a-just-climate

48 These quantities are most often surface variables such as temperature, precipitation, and wind, but in a wider sense the "climate" is the description of the state of the climate system. "Climate Change: a glossary by the Intergovernmental Panel on Climate Change" (1995), at http://www.ipcc.ch/pdf/glossary/ipcc-glossary.pdf

49 Caritas Australia, ibid.

50 Besides industrial processes, large-scale agriculture and transport, other important sources of GHG emissions are domestic use of energy, driving and air travel. Other elements of every-day life contribute to climate change indirectly. Everything, from furniture to computers, from clothes to carpets, uses energy when it is produced and transported, releasing carbon emissions.

51 Intergovernmental Panel on Climate Change (hence, IPCC), Glossary quoted above.

52 "From 10000 year before present up to the year 1750, carbon dioxide abundances stayed within the range 280± 20 ppm (Indermühle *et al*, 1999). During the industrial era, carbon dioxide abundance rose roughly exponentially to 367 ppm in 1999 (Neftel *et al*, 1985; Etheridge *et al*, 1996; IPCC, 2001a) and to 379 ppm in 2005", Historical Overview of Climate Change Science, IPCC 2007. Caritas Australia quotes increases of carbon dioxide levels by 37 percent, methane by 150 percent and nitrous oxide by 18 percent, ibid at 41.

53 The term "the Anthropocene" was used for the first time in 2000 by the Dutch Nobel Prize (atmospheric chemist) Paul J. Crutzen.

54 Climate change 2001: impacts, adaptation, and vulnerability: contribution of Working Group II to the third assessment report of the Intergovernmental Panel on Climate Change. Annex B. Glossary of Terms. http://www.grida.no/climate/ipcc_tar/wg2/689.htm

55 UNDP, 2005.

56 Caritas Australia, ibid.

57 Ibid.

58 Intergovernmental Panel on Climate Change Working Group III, Glossary, p. 818.

59 "Sinks" include forests and other vegetation that absorb and remove CO_2 from the atmosphere.

60 This reflection has been developed by Caritas Mexico in "Dolor de la tierra, dolor de los pobres, Actuemos ya!", 2012, 259 pp.

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91 Ibid, p. XI.

92 "The Future We Want", Outcome Document, paras. 25 and 190.

93 Ibid, para. 192.

94 Ibid, paras. 2 and 8.

95 Ibid, paras. 119–124.

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