

Glossary of Terms Used by the IAASTD

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A

Actor

(to be defined)

Adaptability

Adaptability is the capacity of actors in the system to manage resilience, by changing the 'stability landscape' of the system or controlling the trajectory of the system.

Adaptive Management

The mode of operation in which an intervention (action) is followed by monitoring (learning), with the information then being used in designing and implementing the next intervention (acting again) to steer the system toward a given objective or to modify the objective itself.

Agriculture

The process of producing food, feed, fiber, fuel and other goods by the systematic raising of plants and animals. Agriculture is innovated and managed by people and consists of crops, livestock and pastoralism, fishery and/or forestry by encompassing all stages from production, processing and marketing to the consumer. Agriculture is thus a major part of overall natural resource-based activity.

Agricultural Extension

Agricultural Extension is a science which deals with creation, transmission and application of knowledge and skills designed to bring desirable behavioral changes among people so that they improve their agricultural vocations and enterprises and, therefore, realize higher incomes and better standards of living.

Agricultural Innovation

Agricultural innovation is a socially constructed process. Innovation is the result of the interaction of a multitude of agents and stakeholders. If agricultural research and extension are important to agricultural innovation, so are markets, systems of government, social norms, and, in general, a host of factors that create the incentives for a farmer to decide to change the way in which he or she works, and that reward or frustrate his or her decision.

Agricultural Population

The agricultural population is defined as all persons depending for their livelihood on agriculture, hunting, fishing or forestry. This estimate comprises all persons actively engaged in agriculture and their non-working dependants.

Agricultural Subsidies

Agricultural subsidies can take many forms, but a common feature is an economic transfer, often in direct cash form, from government to farmers. These transfers may aim to reduce the costs of production in the form of an input subsidy, e.g., for inorganic fertilizers or pesticides, or to make up the difference between the actual market price for farm output and a higher guaranteed price. Subsidies shield sectors or products from international competition.

Agricultural System

(to be defined)

Agricultural Waste

Farming wastes, including runoff and leaching of pesticides and fertilizers; erosion and dust from ploughing; improper disposal of animal manure and carcasses; crop residues and debris.

Agrobiodiversity

The diversity of plants, animals, insects, and soil biota found in agricultural systems and on which agriculture depends.

Agroecological Zone

An agroecological zone is a geographically delimited area with similar climatic and ecological characteristics suitable for specific agricultural uses.

Agroecology

The science of applying ecological concepts and principles to the design and management of sustainable agroecosystems.

Agroecosystem

A biological and biophysical natural resource system managed by humans for the primary purpose of producing food as well as other socially valuable nonfood good and environmental services.

Agroforestry

Agroforestry focuses on the wide range of working with trees grown on farms and in rural landscapes. Among these are fertilizer trees for land regeneration, soil health and food security; fruit trees for nutrition; fodder trees that improve smallholder livestock production; timber and fuelwood trees for shelter and energy; medicinal trees to combat disease; and trees that produce gums, resins or latex products. Many of these trees are multipurpose, providing a range of benefits.

Agroforestry Systems

A land-use system in which woody perennials (trees, shrubs, palms, bamboos) are deliberately used on the same land management unit as agricultural crops (woody or not), animals or both, either in some form of spatial arrangement or temporal sequence. In agroforestry systems there are both ecological and economic interactions between the different components.

AIDS (Acquired Immuno-Deficiency Syndrome)

The late stage of infection caused by a virus, the Human Immunodeficiency Virus (HIV).

Aquaculture

The farming of aquatic organisms in inland and coastal areas, involving intervention in the rearing process to enhance production and the individual or corporate ownership of the stock being cultivated. Aquaculture practiced in a marine environment is called mariculture.

Assessment (scientific)

A scientific assessment is a critical, objective evaluation, and analysis of information, including local knowledge, designed to meet user needs and support decision-making. It applies the judgment of experts to existing knowledge to provide scientifically credible answers to policy relevant questions, quantifying where possible the level of confidence.

Average Rate of Return

Average rate of return takes the whole expenditure as given and calculates the rate of return to the global set of expenditures. It indicates whether or not the entire investment package was successful, but it does not indicate whether the allocation of resources between investment components was optimal.

B

Benefit-Cost Ratio

Is the total discounted benefits divided by the total discounted costs.

Biodiversity

Biological diversity means the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.

Bioelectricity

Electricity derived from the combustion of biomass, either directly or co-fired with fossil fuels such as coal and natural gas. Higher levels of conversion efficiency can be attained when biomass is gasified before combustion. (Suggestion IAASTD Secretariat)

Bioenergy (biomass energy)

This report focuses on modern bioenergy, which comprises bioelectricity, bioheat and biofuels. Such modern energy carriers can be produced efficiently from energy crops (e.g. sugar cane, maize, oil palm), natural vegetation (e.g. woods, grasses) and organic wastes and residues (e.g. from forestry and agriculture). In contrast, traditional bioenergy refers to the direct combustion of biomass, mostly for heating and cooking purposes, and is often associated with inefficient production, unsustainable harvesting of natural vegetation and heavy indoor air pollution. (Suggestion IAASTD Secretariat)

Biofuel

This report focuses on modern biofuel, i.e. liquid fuels derived from biomass and predominantly used in transportation. The dominant biofuels are ethanol and biodiesel. Ethanol is produced by fermenting starch contained in plants such as sugar cane, sugar beet, maize, cassava, sweet sorghum or beetroots. Biodiesel is typically produced through a chemical process called transesterification, whereby oily biomass such as rapeseed, soybeans, palm oil, jatropha seeds, waste cooking oils or vegetable oils is combined with methanol to form methyl esters (sometimes called "fatty acid methyl ester" or FAME). (Suggestion IAASTD Secretariat)

Bioheat

Heat produced from the combustion of biomass, mostly as industrial process heat and heating for buildings. (Suggestion IAASTD Secretariat)

Biological Resources

Biological resources includes genetic resources, organisms or parts thereof, populations, or any other biotic component of ecosystems with actual or potential use or value for humanity.

Biotechnology

Biotechnology means any technological application that uses biological systems, living organisms, or derivatives thereof, to make or to modify products or processes for specific use.

C

Capital

(to be defined)

Capture Fisheries

The sum (or range) of all activities to harvest a given fish resource from the 'wild'. It may refer to the location (e.g. Morocco, Georges Bank), the target resource (e.g. hake), the technology used (e.g. trawl or beach seine), the social characteristics (e.g. artisanal, industrial), the purpose (e.g. commercial, subsistence, or recreational) as well as the season (e.g. winter). (Suggestion Coates)

Cellulosic Ethanol

Next generation biofuel that allows converting not only glucose but also cellulose and hemicellulose – the main building blocks of most biomass – into ethanol, usually using acid-based catalysis or enzyme-based reactions to break down plant fibers into sugar, which is then fermented into ethanol.

Commercialization

The process of increasing the share of income that is earned in cash (e.g. wage income, surplus production for marketing) and reducing the share that is earned in kind (e.g. growing food for consumption by the same household).

D

Decapitalization

Sale of livestock, equipment, deterioration of infrastructure, and degradation of natural capital (soils, vegetation cover, etc.).

Deforestation

The action or process of changing forested land to non-forested land.

Degradation

Degradation is the result of processes that alter the ecological characteristics of terrestrial or aquatic (agro-)ecosystems so that the net services that they provide are reduced. Continued degradation leads to zero or negative economic agricultural productivity. For loss of “land” in quantitative or qualitative ways, the term “degradation” is used. For water resources rendered unavailable for agricultural and non-agricultural uses, we employ the terms “depletion” and “pollution”. “Soil” degradation refers to the processes that reduce the capacity of the soil to support agriculture.

Desertification

Land degradation in drylands resulting from various factors, including climatic variations and human activities.

Determinants of Well-being

Inputs into the production of well-being, such as food, clothing, potable water, and access to knowledge and information. Ten constituents and determinants of well-being are closely related to ecosystems: (1) being able to be adequately nourished; (2) being able to be free from avoidable disease; (3) being able to live in an environmentally clean and safe shelter; (4) being able to have adequate and clean drinking water; (5) being able to have clean air; (6) being able to keep warm and cook; (7) being able to use traditional medicine; (7) being able to use traditional medicine; (8) being able to continue using natural elements found in ecosystems for traditional cultural and spiritual practices; (9) being able to cope with extreme natural events including floods, tropical storms and landslides; (10) being able to make sustainable management decisions that respect natural resources and enable the achievement of a sustainable income stream.

Development

The two major elements of development are growth and diversification. Development is a normative concept that entails complex changes and transformations over time.

Disciplinary Research

Research that pursues cognitive and practical goals within a clearly defined scientific school and related institutional framework.

Domesticated or Cultivated Species

Domesticated or cultivated species means species in which the evolutionary process has been influenced by humans to meet their needs.

Domestication

Is the process to accustom animals to live with people as well as to selectively cultivate plants or raise animals in order to increase their suitability and compatibility to human requirements.

Driver

Any natural or human-induced factor that directly or indirectly causes a change in an ecosystem.

Driver, direct

A driver that unequivocally influences ecosystem processes and can therefore be identified and measured to different degrees of accuracy.

Driver, endogenous

A driver whose magnitude can be influenced by the decision-maker. The endogenous or exogenous characteristic of a driver depends on the organizational scale. Some drivers (e.g., prices) are exogenous to a decision-maker at one level (a farmer) but endogenous at other levels (the nation-state).

1 **Driver, exogenous**

2 A driver that cannot be altered by the decision-maker.

3 **Driver, indirect**

4 A driver that operates by altering the level or rate of change of one or more direct drivers.

5 **E**

6 **Ecoagriculture**

7 A management approach that provides fair balance between production of food, feed and fiber and
8 protection of the ecosystem.

9 **Economic Growth**

10 Economic growth is the increase in the value of goods and services produced by an economy. It is
11 generally considered to be an increase in the wealth, or more precisely the income, of a nation or
12 entity. It is conventionally measure as the percent rate of increase in real Gross Domestic Product
13 (GDP).

14 **Economic Rate of Return**

15 The net benefits to all members of society as a percentage of cost, taking into account externalities
16 and other market imperfections.

17 **Ecosystem**

18 A dynamic complex of plant, animal, and microorganism communities and their nonliving
19 environment interacting as a functional unit.

20 **Ecosystem Approach**

21 A strategy for the integrated management of land, water, and living resources that promotes
22 conservation and sustainable use in an equitable way.

23 An ecosystem approach is based on the application of appropriate scientific methodologies focused
24 on levels of biological organization, which encompass the essential structure, processes, functions,
25 and interactions among organisms and their environment. It recognizes that humans, with their
26 cultural diversity, are an integral component and managers of many ecosystems.

27 **Ecosystem Function**

28 An intrinsic ecosystem characteristic related to the set of conditions and processes whereby an
29 ecosystem maintains its integrity (such as primary productivity, food chain biogeochemical cycles).
30 Ecosystem functions include such processes as decomposition, production, nutrient cycling, and
31 fluxes of nutrients and energy.

32 **Ecosystem Management**

33 An approach to maintaining or restoring the composition, structure, function, and delivery of services
34 of natural and modified ecosystems for the goal of achieving sustainability. It is based on an
35 adaptive, collaboratively developed vision of desired future conditions that integrates ecological,
36 socioeconomic, and institutional perspectives, applied within a geographic framework, and defined
37 primarily by natural ecological boundaries.

38 **Ecosystem Properties**

39 The size, biodiversity, stability, degree of organization, internal exchanges of material and energy
40 among different pools, and other properties that characterize an ecosystem.

41 **Ecosystem Services**

42 The benefits people obtain from ecosystems. These include provisioning services such as food and
43 water; regulating services such as flood and disease control; cultural services such as spiritual,
44 recreational, and cultural benefits; and supporting services such as nutrient cycling that maintain the
45 conditions for life on Earth. The concept "ecosystem goods and services" is synonymous with
46 ecosystem services.

47 **Ecosystem Stability**

A description of the dynamic properties of an ecosystem. An ecosystem is considered stable if it returns to its original state shortly after a perturbation (resilience), exhibits low temporal variability (constancy), or does not change dramatically in the face of a perturbation (resistance).

Ecotourism

Ecotourism embraces the principles of sustainable tourism, concerning the economic, social and environmental impacts of tourism. It also embraces the following specific principles which distinguish it from the wider concept of sustainable tourism: (1) contributes actively to the conservation of natural and cultural heritage; (2) includes local and indigenous communities in its planning, development and operation, and contributing to their well-being; (3) interprets the natural and cultural heritage of the destination to visitors, (4) lends itself better to independent travelers, as well as to organized tours for small size groups.

Environment

All external conditions that affect an organism or other specified system during its lifetime. Although it is common to refer to 'the' environment, there are in fact many environments e.g., ecological, social, political or economic, all capable of change in time and place, but all intimately linked and in combination with nature and society.

Environmental Impact

Environmental impact refers to the impact on the environment of different activities such as: adoption of modern agricultural technologies in the form of use of fertilizers or pesticides leading to surface and groundwater contamination by toxic chemical and algae, resulting in significant environmental costs. On the other hand, adoption of minimum tillage technology and herbicides by farmers has environmental benefits in the form of reduced soil erosion and nutrient loss.

Empowerment

Empowerment is used to denote an ongoing process that strengthens the self-confidence of disadvantaged sections of the population, enables them to articulate their interests and participate in the community, and provides them with access to and control over resources. This helps them to make responsible control of their lives and participate in the political process. Changes in the social, economic, legal and political institutions, that embody the current relations of power therefore play a key role in this process.

Equity

Fairness of rights, distribution, and access. Depending on the context, this can refer to resources, services or power.

Ex-ante

The analysis of the effects of a policy or a project based only on information available before the policy or project is undertaken.

Ex-post

The analysis of the effects of a policy or project based on information available after the policy or project has been implemented and its performance is observed.

Ex-situ Conservation

Ex-situ conservation means the conservation of components of biological diversity outside their natural habitats.

Externalities

Effects of a person's or firm's activities on others which are not compensated. Externalities can either hurt or benefit others – they can be negative or positive. One negative externality arises when a company pollutes the local environment to produce its goods and does not compensate the negatively affected local residents. Positive externalities can be produced through primary education – which benefits not only primary students but also society at large. Governments can reduce negative externalities by regulating and taxing goods with negative externalities. Governments can increase positive externalities by subsidizing goods with positive externalities or by directly providing those goods.

F

Farm System

Each individual farm has its own specific characteristics arising from variations in resource endowments and family circumstances. The household, its resources, and the resource flows and interactions at this individual farm level are together referred to as a farm system. The biophysical, socio-economic and human elements of a farm are interdependent, and thus farms can be analyzed as systems from various points of view.

Farmer-led Participatory Plant Breeding

Researchers and/or development workers interact with farmer-controlled, managed and executed PPB activities, and build on farmers' own varietal development and seed systems.

Farming System

A farming system is defined as a population of individual farm systems that have broadly similar resource bases, enterprise patterns, household livelihoods and constraints, and for which similar development strategies and interventions would be appropriate. Depending on the scale of analysis, a farming system can encompass a few dozen or many millions of households.

Fishery

Generally, a fishery is an activity leading to harvesting of fish. It may involve capture of wild fish or raising of fish through aquaculture.

Food Security

Food security exists when all people of a given spatial unit, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life, and that is obtained in a socially acceptable and ecologically sustainable manner.

Food Sovereignty

Food sovereignty is the right of peoples, communities, and countries to define their own agricultural, labor, fishing, food and land policies which are ecologically, socially, economically and culturally appropriate to their unique circumstances. It includes the true right to food and to produce food, which means that all people have the right to safe, nutritious and culturally appropriate food and to food-producing resources and the ability to sustain themselves and their societies.

Food System

A term that encompasses the whole range of food production and consumption activities. The food system included farm input supply, farm production, food processing, wholesale and retail distribution, marketing, and consumption.

Forecast

See prediction.

Forest

A vegetation type dominated by trees. Many definitions of the term forest are in use throughout the world, reflecting wide differences in bio-geophysical conditions, social structure, and economics.

Forestry

The human utilization of a piece of forest for a certain purpose (such as timber or recreation).

Forest Systems

Forest systems are lands dominated by trees; they are of the used for timber, fuelwood, and non-wood forest products.

Formal-led Participatory Plant Breeding

Farmers are asked to contribute to PPB activities which are basically controlled, managed, and executed by an International Agricultural Research Centre (IARC), National Agricultural Research System (NARS) or an NGO.

Full-Time Equivalent (FTE) Researchers

Staff of agencies that conduct research and hold at least a BSc degree or equivalent. FTE corrections were only made when more than 20% of the reported staff time was spent on activities other than R&D, such as extension, teaching or technical services.

G

Gender

Gender refers to the socially constructed roles and behaviors of, and relations between, men and women, as opposed to sex, which refers to biological differences. Societies assign specific entitlements, responsibilities and values to men and women of social strata and sub-groups. Worldwide, systems of relation between men and women tend to disadvantage women, within the family as well as in public life. Like the hierarchical framework of a society, gender roles and relations vary according to context and are constantly subject to changes.

Gender Analysis (GA)

The systematic gathering and examination of information on gender differences and social relations in order to identify, understand and redress inequities based on gender.

Gender Approach

A gender approach implies that attitudes, roles, responsibilities and rights of men and women are taken into account, that it is recognized that both sexes do not necessarily have the same access to, or control over, resources, and that work, benefits and impacts may be different for both groups. The gender approach aims to have both women and men participate, make decisions and share benefits, it explores potentials of male and female cooperation and synergies, and takes into account that gender roles and relations change over time.

Gender Equity

Gender equity goes beyond gender equality that denotes women having the same opportunities in life as men. Gender equity refers to the equivalence in life outcomes for women and men, recognizing their different needs and interests, and requiring a redistribution of power and resources. Gender equity is a specific approach within social equity, social justice and human rights approaches. They all support a transformative change towards social inclusion of disadvantaged and suppressed individuals and groups.

Gender Sensitive

Methods, analyses, policies, practices, behaviors, etc. that recognize gender issues as important and seek to institutionalize or mainstream attention to gender issues.

Genetic Material

Genetic material means any material of plant, animal, microbial or other origin containing functional units of heredity.

Global Change

Global-scale human, human-induced and natural changes that modify the functionality of the natural, social, economic and cultural dimensions of the Earth system.

Globalization

Increasing interlinking of political, economic, institutional, social, cultural, technical, and ecological issues at the global level.

GMO (Genetically Modified Organism)

An organism in which the genetic material has been altered anthropogenically by means of gene or cell technologies. See LMO (Suggestion CropLife)

1 Governance

2 Governance is the framework of social and economic systems and legal and political structures
3 through which humanity manages itself.

4 Global Environmental Change

5 Changes in the environment that may alter the capacity of the earth to sustain life.

6 Global Environmental Governance

7 The global biosphere behaves as a single system, where the environmental impacts of each nation
8 ultimately affect the whole. That makes a coordinated response from the community of nations a
9 necessity for reversing today's environmental decline.

10 Global Warming

11 Refers to an increase in the globally-averaged surface temperature in response to the increase of
12 well-mixed greenhouse gases, particularly CO₂.

13 Global Warming Potential

14 An index, describing the radiative characteristics of well-mixed greenhouse gases, that represents
15 the combined effect of the differing times these gases remain in the atmosphere and their relative
16 effectiveness in absorbing outgoing infrared radiation. This index approximates the time-integrated
17 warming effect of a unit mass of a given greenhouse gas in today's atmosphere, relative to that of
18 carbon dioxide.

19 Governance for Sustainable Development

20 Governance is a social function designed to manage interdependencies within human societies and
21 between human and natural systems. Governance systems include institutions, legal regimes, and
22 other arrangements that perform the function of governance by setting the "rules of the game."
23 These rules may include decision-making procedures, enforcement and compliance mechanisms,
24 and other systems to assign roles to agents and guide interactions, all giving rise to the social norms
25 and practices that shape the quest for sustainable development.

26 Governance of Natural Resources

27 "Governance of natural resources" can be understood as the interactions among structures,
28 processes and traditions expressed in formal and informal norms that determine how power and
29 responsibilities are exercised, how decisions are taken, and how citizens or other stakeholders have
30 their say in the use of natural resources-including biodiversity conservation.

31 Growth Rate

32 The change (increase, decrease, or no change) in an indicator over a period of time, expressed as a
33 percentage of the indicator at the start of the period. Growth rates contain several sets of
34 information. The first is whether there is any change at all; the second is what direction the change is
35 going in (increasing or decreasing); and the third is how rapidly that change is occurring.

36 H

37 Habitat

38 Area occupied by and supporting living organisms. Also used to mean the environmental attributes
39 required by a particular species or its ecological niche.

40 Hazard

41 A potentially damaging physical event, phenomenon and/or human activity, which may cause the life
42 or injury, property damage, social and economic disruption or environmental degradation.
43 Hazards can include latent conditions that may represent future threats and can have different
44 origins:

45 Health

46 Health is a state of complete physical, mental and social well-being and not merely the absence of
47 disease or infirmity.

1 HIV (Human Immunodeficiency Virus)

2 A virus that steadily weakens the body's defense (immune) system until it can no longer fight off
 3 infections such as pneumonia, diarrhea, tumors and other illnesses. All of which can be part of AIDS
 4 (Acquired Immunodeficiency Syndrome). Unable to fight back, most people die within three years of
 5 the first signs of AIDS appearing. Most of all HIV infections have been transmitted through
 6 unprotected sexual intercourse with someone who is already infected with HIV. HIV can also be
 7 transmitted by infected blood or blood products (as in blood transfusions), by the sharing of
 8 contaminated needles, and from an infected woman to her baby before birth, during delivery, or
 9 through breast-feeding.

10 Household

11 All the persons, kin and non-kin, who live in the same dwelling and share income, expenses and
 12 daily subsistence tasks. A basic unit for socio-cultural and economic analysis, a household may
 13 consist of persons (sometimes one but generally two or more) living together and jointly making
 14 provision for food or other essential elements of the livelihood.

15 Hunger

16 Hunger: A condition in which people lack the basic food intake to provide them with the energy and
 17 nutrients for fully productive, active lives.

18 I/J**19 Ideotype**

20 A conceptual model of a plant type that will be best suited to a particular set of circumstances.
 21 Ideotypes can be defined in terms of both form and function. There can be 'isolation', 'competition'
 22 and 'crop' ideotypes.

23 Impact

24 Impacts are changes in a situation brought about by an intervention. They may be intended or
 25 unintended, expected or unexpected, positive or negative.

26 Indicator

27 Information based on measured data used to represent a particular attribute, characteristic, or
 28 property of a system.

29 Information

30 Information takes the shape of structures and formatted data that remain passive and inert until used
 31 by those with the knowledge needed to interpret and process them. It is only the 'meaning' that users
 32 attach to information that makes it into knowledge.

33 Infrastructure

34 The term infrastructure is defined here as the facilities, structures, and associated equipment and
 35 services that facilitate the flows of goods and services between individuals, firms, and governments.
 36 It includes public utilities (electric power, telecommunications, water supply, sanitation and
 37 sewerage, and waste disposal); public works (irrigation systems, schools, housing, and hospitals);
 38 transport services (roads, railways, ports, waterways, and airports); and R&D facilities.

39 Innovation

40 The use of a new idea, material, or technology to change an activity, development, good, or service
 41 or the way goods and services are produced, distributed, or disposed of.

42 Innovation system

43 Innovation systems may be defined as comprising institutions, enterprises, and individuals that
 44 together demand and supply knowledge and technology, and the rules and mechanisms by which
 45 these different agents interact.

46 In recent development discourse these ideas have also been expanded in more cross-cultural
 47 directions: Agricultural innovation is conceptualized as part and parcel of social and ecological
 48 organization, rather than in terms of transfer of knowledge and / or technologies.

1 In-situ Conservation

2 In-situ conservation means the conservation of ecosystems and natural habitats and the
3 maintenance and recovery of viable populations of species in their natural habitats and the
4 maintenance and recovery of viable populations of species in their natural surroundings and, in the
5 case of domesticated or cultivated species, in the surroundings where they have developed their
6 distinctive properties and were managed by local groups of farmers, fishers or foresters.

7 Institutions

8 The rules that guide how people within societies live, work, and interact with each other. Formal
9 institutions are written or codified rules. Examples of formal institutions would be the constitution, the
10 judiciary laws, the organized market, and property rights. Informal institutions are rules governed by
11 social and behavioral norms of the society, family, or community.

12 Integrated Approaches

13 Integrated approaches search for the best use of the functional relations among living organisms in
14 relation to the environment, without excluding use of external inputs. Integrated approaches aim at
15 the achievement of multiple goals (productivity increase, environmental sustainability and social
16 welfare) using a variety of methods.

17 Integrated Assessment

18 A method of analysis that combines results and models from the physical, biological, economic, and
19 social sciences, and the interactions between these components, in a consistent framework, to
20 evaluate the status and the consequences of environmental change and the policy responses to it.

21 Integrated Natural Resources Management

22 Integrated natural resources management (INRM) is an approach that integrates research of
23 different types of natural resources into stakeholder-driven processes of adaptive management and
24 innovation to improve livelihoods, agroecosystem resilience, agricultural productivity and
25 environmental services at community, eco-regional and global scales of intervention and impact.
26 INRM thus aims to help to solve complex real-world problems affecting natural resources in
27 agroecosystems.

28 Integrated Pest Management

29 The procedure of integrating and applying practical management methods, to keep pest species
30 from reaching damaging levels while minimizing potentially harmful effects of pest management
31 measures on humans, non-target species, and the environment, incorporating assessment methods
32 to guide management decisions.

33 Intellectual Property Rights

34 Intellectual property rights (IPRs) are legal rights granted by governmental authorities to control
35 certain products of human intellectual effort and ingenuity.

36 Interdisciplinary Research

37 Research that integrates two or more scientific disciplines with the goal of advancing the
38 understanding of complex cognitive and practical problems.

39 Internal Rate of Return

40 The discount rate that sets the net present value of the stream of the net benefits equal to zero. The
41 internal rate of return may have multiple values when the stream of net benefits alternates from
42 negative to positive more than once.

43 International Dollars

44 Agricultural R&D investments in local currency units have been converted into international dollars
45 by deflating the local currency amounts with each country's inflation ration (GDP deflator) of base
46 year 2000. Next, they were converted to US dollars with a 2000 purchasing power parity (PPP)
47 index. PPPs are synthetic exchange rates used to reflect the purchasing power of currencies,
48 typically comparing prices among a broader range of goods and services than conventional
49 exchange rates.

1 Irrigation

2 Water artificially applied to soil and confined in time and space. It enables to meet the water
3 requirements of a crop at a given time of its vegetative cycle or to bring the soil to the desired
4 moisture level outside the vegetative cycle. The irrigation systems can be fully equipped, just
5 partially equipped, or managed in a “traditional” way. The equipment may be for permanent or
6 supplementary irrigation.

7 K

8 Knowledge

9 Knowledge concerns the way people understand the world, the ways in which they interpret and
10 apply meaning to their experiences. Knowledge is not about the discovery of some finale objective
11 ‘truth’ but about the grasping of subjective culturally-conditioned products emerging from complex
12 and ongoing processes involving selection, rejection, creation, development and transformation of
13 information. These processes, and hence knowledge, are inextricably linked to the social,
14 environmental and institutional context within which they are found.

15 In order to specify more concretely what knowledge is in a certain space, time or context it is useful
16 to relate to different types of knowledge; the most common types of knowledge are:

17 *Scientific knowledge*

18 Has been legitimized and validated by a clearly formalized process of data gathering, analysis and
19 documentation. Science has built in dynamic regarding the improvement of knowledge. Other forms
20 of knowledge (empirical, indigenous or local knowledge) also is involved in shaping human action
21 but are not recognized as having the same properties in terms of proven reliability and generability.

22 *Explicit knowledge*

23 Concerns knowledge that has been or can be articulated, codified, and stored in certain media
24 . The most common forms of explicit knowledge are manuals, documents, procedures, and stories.
25 Knowledge also can be audio-visual. Works of art and product design can be seen as other forms
26 of explicit knowledge where human skills, motives and knowledge are externalized

27 *Empirical knowledge*

28 It may be traditional or modern. It is frequently specific to a local context and is acquired through
29 individual and collective learning. Empirical knowledge is often based on intersubjective and
30 qualitative rather than on scientific quantitative validation; it is nevertheless dynamic and is used by
31 all of us in our daily lives guiding action, ethical orientation and interpretation.

32 *Tacit knowledge*

33 Tacit knowledge can be defined as subtle conception rooted in cognitive schemata or “mental
34 models” that is difficult to exteriorize. Tacit knowledge is characterized as highly personal and hard
35 to formalize, making it difficult to communicate or to share with others. Subjective insights, intuitions,
36 and hunches fall into this category of knowledge.

37 *Indigenous or local knowledge*

38 The knowledge that is unique to a given culture or society. In development contexts it is related to
39 any knowledge held by non-scientific communities, informing interpretation of the world. It may
40 encompass any domain in development, particularly that pertaining to natural resource
41 management. It is conditioned by socio-cultural tradition, being culturally relative understanding
42 inculcated into individuals from birth, structuring how they interface with their environments.

43 *System, target and transformation knowledge*

44 The differentiation of system, target and transformation knowledge emerges from transdisciplinary
45 action-research in the field of sustainable development. Research in sustainable development is
46 based on (1) Systems knowledge which asks: “Why and how do processes occur and where is
47 change needed?” It focuses on the analysis and valuation of processes in empirical systems related
48 to purposes and practices (2) Target knowledge that asks “What are better practices (targets)?” It
49 emphasizes on the analysis and valuation of targets related to states of empirical systems and
50 practices. (3) Transformation knowledge aims to answer the question about: “How can existing
51 practices be transformed: pragmatic and normative level?” and places emphasis on the analysis and
52 valuation of transformations related to empirical systems and purposes.

53 Knowledge Management

54 Knowledge management is a systematic discipline of policies, processes, and activities which
55 empower organizations to apply.

56 Knowledge Society

1 A society in which the production and dissemination of scientific information and knowledge function
2 well, and in which the transmission and use of valuable experiential knowledge is optimized; a
3 society in which the information of those with experiential knowledge is used together with that of
4 scientific and technical experts to inform decision-making.

5 **L**

6 **Land**

7 The term “land” refers to a spatial unit containing all natural resources – i.e. minerals, soils, water,
8 flora and fauna – as well as to all the land use types occurring on it.

9 **Land Cover**

10 The physical coverage of land, usually expressed in terms of vegetation cover or lack of it.
11 Influenced by but non synonymous with land use.

12 **Land Degradation**

13 Land degradation is the reduction in the capability of the land to produce benefits from a particular
14 land use under a specific form of land management.

15 **Landscape**

16 An area of land that contains a mosaic of ecosystems, including human-dominated ecosystems. The
17 term cultural landscape is often used when referring to landscapes containing significant human
18 populations.

19 **Land Tenure**

20 The relationship, whether legally or customarily defined, among people, as individuals or groups,
21 with respect to land and associated natural resources (water, trees, minerals, wildlife, and so on).
22 Rules of tenure define how property rights in land are to be allocated within societies. Land tenure
23 systems determine who can use what resources for how long, and under what conditions.

24 **Land Use**

25 The human utilization of a piece of land for a certain purpose (such as irrigated agriculture or
26 recreation). Land use is influenced by, but not synonymous with, land cover.

27 **Livelihood**

28 A livelihood comprises people, their capabilities and their means of living, including food, income and
29 assets. Tangible assets are resources and stores, and intangible assets are claims and access. A
30 livelihood is environmentally sustainable when it maintains or enhances the local and global assets
31 in which livelihoods depend, and has net beneficial effects on other livelihoods. A livelihood is
32 socially sustainable which can cope with and recover from stress and shocks, and provide for future
33 generations.'

34 **LMO (living modified organism)**

35 Living modified organism means any living organism that possesses a novel combination of genetic
36 material obtained through the use of modern biotechnology. (Suggestion CropLife)

37 **M**

38 **Malnutrition**

39 Failure to achieve nutrient requirements, which can impair physical and/or mental health. It may
40 result from consuming too little food or a shortage or imbalance of key nutrients (eg, micronutrient
41 deficiencies or excess consumption of refined sugar and fat).

42 **Marginal Rates of Return**

43 Marginal rates of return calculates the returns to the last dollar invested on a certain activity. It is
44 usually estimated through econometric estimation.

45 **Market**

A collection of buyers and sellers who interact, resulting in the exchange of goods and services.

Model

A simplified representation of reality used to simulate a process, understand a situation, predict an outcome or analyze a problem. A model can be viewed as a selective approximation, which by elimination of incidental detail, allows some fundamental aspects of the real world to appear or be tested.

Modern Biotechnology

Modern biotechnology means the application of:

- (a) In vitro nucleic acid techniques, including recombinant deoxyribonucleic acid (DNA) and direct injection of nucleic acid into cells or organelles, or
- (b) Fusion of cells beyond the taxonomic family, that overcome natural physiological reproductive or recombination barriers and that are not techniques used in traditional breeding and selection. (Suggestion CropLife)

Multidisciplinary Research

Research based on a combination of several scientific disciplines, without implying that continual interaction and negotiation between these disciplines is necessary (as opposed to interdisciplinary research).

Multifunctionality

Multifunctionality refers to the fact that an activity may have multiple outputs and, by virtue of this, may contribute to several societal objectives at once. Multifunctionality is thus an activity oriented concept that refers to specific properties of the production process and its multiple outputs.

Multifunctionality of Agriculture

Multifunctionality in agriculture refers to non-commodity outputs of agriculture that satisfy two conditions: they are jointly produced with commodity outputs; and they provide social value (impose social costs) not reflected in markets.

Multi-Stakeholder Processes

Multi-stakeholder processes describe processes which aim to bring together all major stakeholders in a new form of communication, decision-finding (and possibly decision-making) on a particular issues. They are also based on principles of equity, accountability, transparency, participation and partnership. Multi-stakeholder processes cover a wide spectrum of structures and levels of engagement. They can comprise dialogues on policy or grow to include consensus-building, decision-making and implementation of practical solutions. The exact nature of any such process will depend on the issues, its objectives, participants, scope and time lines, among other factors.

N

Natural Resources

Natural resources are those component of natural systems, both biotic and abiotic, that are considered useful by humans either actually or potentially.

Net Present Value (NPV)

Net present value is used to analyze the profitability of an investment or project. The difference between the discounted present value of benefits and the discounted present value of costs. If NPV of a prospective project is positive, then the project should be accepted. The analysis of NPV is sensitive to the reliability of future cash inflows that an investment or project will yield.

Norms

A norm in the generic sense (i.e., encompassing all the various types of norms) involves: (1) a collective evaluation of behavior in terms of what it ought to be; (2) a collective expectation as to what behavior will be; and/or (3) particular reactions to behavior, including attempts to apply sanctions or otherwise induce a particular kind of conduct.

Nutrient

Nutrient can be any substance that can be metabolized by an organism to give energy and build tissue.

Nutrition

Nutrition is the process of nourishing or being nourished, especially the process by which a living organism assimilates food and uses it for growth and for replacement of tissues. It is the science or study that deals with food and nourishment, especially in humans. Nutrition is also defined as a source of nourishment; food.

O

Organic Agriculture

Organic agriculture is an ecological production management system that promotes and enhances biological cycles and soil biological activity. It is based on minimal use of off-farm inputs and on management practices that restore, maintain and enhance ecological harmony.

Organization

Groups of individuals bound by some common purpose to achieve objectives (distinguished from institutions). Organizations can be formal or informal. Examples of organizations are government agencies (e.g. police force, ministries, etc.), administrative bodies (e.g. local government), non governmental organizations, associations (e.g. farmers' associations) and private companies (firms).

Outcome

The results achieved at the level of 'purpose' in the objective hierarchy. Outcome is part of impact (result at purpose and goal level).

Output

The tangible (easily measurable, practical), immediate and intended results to be produced through sound management of the agreed inputs. Examples of outputs include goods, services or infrastructure produced by a project and meant to help realize its purpose. These may also include changes, resulting from the intervention, that are needed to achieve the outcomes at the purpose level.

P

Paradigm

This term refers to the set of questions, practices and institutional arrangements which characterize scientific activity, for a particular historical period.

Participation

The term 'participation' is an imprecise normative term that directs attention to interacting relationships rather than entities. It can usefully be broken down within a typology that characterizes the structure and quality of interaction in terms of means and ends.

Participatory Development

Participatory development is a process that involves people (population groups, organizations, associations, political parties) actively and significantly in all decisions affecting their lives.

Participatory Domestication

Participatory domestication refers to the process of domestication that involves people actively and significantly in decision-making and taking action.

Participatory Plant Breeding (PPB)

A range of actors including scientists, farmers, consumers, extension agents, vendors, processors and other industry stakeholders – as well as farmers' and community-based organizations and non-government organization (NGOs) are involved in plant breeding research and development. This activity is deemed 'participatory' when any mix of these actors, especially end users, have a significant research role in all major stages of the breeding and selection process.

Participatory Varietal Selection (PVS)

Farmers and other stakeholders along the food chain are involved with researchers in the selection of varieties from formal and farmer-based collections and trials, to determine which are best suited to their own agroecosystems, needs, uses and preferences, and which should go ahead for finishing, wider release and dissemination. The information gathered may in turn be fed back into formal-led breeding programmes.

Policy

Policy is a set of decisions which are oriented towards a long-term purpose or to a particular problem. Such decisions by governments are often embodied in legislation and usually apply to a country as a whole rather than to one part of it.

Policy Failure

A situation in which government policies and practices create inefficiencies in the use of goods and services.

Poverty

Poverty is determined by the following factors:

- materialities: things the lack of which is perceived as poverty;
- the subject's own perceptions of his or her condition that is the individual's perception of materialities as an expression of poverty. This perception is quite a personal and socio-cultural affair;
- how others view the poor: the poor's perception of their predicament is inevitably affected by how others view them;
- spimes (socio-cultural space-times) affecting various perceptions of poverty. The above dimensions are affected by space-times to which they belong to.

Absolute Poverty

Individuals or households in absolute poverty are not able to satisfy their minimum requirements for food, clothing or shelter. The dollar a day poverty line is accepted internationally as an absolute poverty line. In contrast, relative poverty lines are set with respect to the standard of living and social norms in particular countries.

Chronic Poverty

Poverty experienced when household resources are insufficient to lift its members above the poverty line over a long period. Chronic poverty is the opposite of transient poverty.

Dimensions of Poverty

The individual and social characteristics of poverty such as lack of access to health and education, powerlessness or lack of dignity. Such aspects of deprivation experienced by the individual or group are not captured by measures of income or expenditure. See also income poverty.

Extreme poverty

Persons who fall below a defined poverty line. For example, in 1993 the World Bank defined an upper poverty line of US\$ 1 income per day and extreme poverty as persons living on less than US\$ 0.75 income per day (both in 1985 prices). These measures are converted into local currencies using purchasing power parity (PPP) exchange rates. Other definitions of this concept have identified minimum subsistence requirements, the denial of basic human rights or the experience of exclusion.

Income (or Consumption) Poverty

Poverty defined with respect to a money-based poverty line for income or expenditure. The distinction is made between this and other concepts that emphasize the many dimensions of poverty.

Poverty gap

A measure of how far people are below the poverty line. It is calculated as the average distance of the poor below the poverty line multiplied by the headcount.

Poverty Line

A minimum requirement of welfare, usually defined in relation to income or expenditure, used to identify the poor. Individuals or households with incomes or expenditure below the poverty line are poor. Those with incomes or expenditure equal to or above the line are not poor. It is common practice to draw more than one poverty line to distinguish different categories of poor, for example, the extreme poor.

Relative Poverty

Poverty is defined in relation to the social norms and standard of living in a particular society. It can therefore include the individual's ability to take part in activities that society values even if they are not necessary for survival.

1 *Transient Poverty*

2 Poverty experienced as the result of a temporary fall in income or expenditure although over a longer
3 period the household resources are on average sufficient to keep the household above the poverty
4 line.

5 **Prediction**

6 The result of an attempt to produce a most likely description or estimate of the actual evolution of a
7 variable or system in the future.

8 **Private Rate of Return**

9 is the gain in net revenue to the private firm/business divided by the cost of an investment expressed
10 in percentage.

11 **Processes**

12 A series of actions, motions, occurrences, a method, mode, or operation, whereby a result or effect
13 is produced.

14 **Production**

15 Production is the same as output. It is a physical produce and can be reported in units of volume or
16 weight. For instance, cereal production would be reported in metric tons.

17 **Production Technology**

18 Production technology broadly refers to all methods that farmers, market agents and consumers use
19 to cultivate, harvest, store, process, handle, transport and prepare food crops, cash crops, livestock,
20 etc. for consumption.

21 **Productivity**

22 Productivity is defined as output per unit of input, where 'input' can be land, labor and / or capital,
23 and 'output' is agricultural produce. The importance of productivity, however precisely defined, is that
24 it gives a measure for efficiency. It tells us in one figure how much input was used to produce a unit
25 of output.

26 **Projection**

27 A potential future evolution of a quantity or set of quantities, often computed with the aid of a model.
28 Projection s are distinguished from "predictions" in order to emphasize that projections involve
29 assumptions concerning, for example, future socioeconomic and technological developments that
30 may or may not be realized; they are therefore subject to substantial uncertainty.

31 **Protected Area**

32 Protected area means a geographically defined area which is designated or regulated and managed
33 to achieve specific conservation objectives.

34 **Public R&D Investment**

35 Includes R&D investments done by government agencies, nonprofit institutions, and higher-
36 education agencies. It excludes the private for-profit enterprises.

37 **R**

38 **Reclamation**

39 Reclamation is the action or process of reclaiming, e.g. the conversion of wasteland into land
40 suitable for use of habitation or cultivation.

41 **Research**

42 Research and experimental development comprises creative work undertaken on a systematic basis
43 in order to increase the stock of knowledge, including knowledge of man (sic), culture and society,
44 and the use of this stock of knowledge to devise new applications.

45 **Research and Development Technology**

Research and development technology refers to organizational strategies and methods used by research and extension programme in conduction their work including scientific procedures, organizational modes, institutional strategies, interdisciplinary team research, etc.

Research Partnership

Inter-institutional or interpersonal collaborative alliance in a research programme involving international and multicultural partners, and guided by a set of 11 principles: (1) decide on the objectives together, (2) build mutual trust, (3) share information and develop networks, (4) share responsibility, (5) create transparency, (6) monitor and evaluate the collaboration, (7) disseminate the results, (8) apply the results, (9) share profits equitably, (10) increase research capacity and (11) build on the achievements.

Resilience

The capacity of a system to tolerate impacts of drivers without irreversible change in its outputs or structure.

OR:

Resilience is the capacity of a system to absorb disturbance and re-organize while undergoing change so as to still retain essentially the same function, structure, identity and feedbacks

Resources

A person, thing, or action that is used to produce a desired effect or product, usually for meeting human needs or improving the quality of life.

Risk

The probability of harmful consequences, or expected loss (of lives, people injured, property, livelihoods, economic activity disrupted or environment damaged) resulting from interactions between natural or human induced hazards and vulnerable/capable conditions. Conventionally risk is expressed by the equation $\text{Risk} = \text{Hazard} \times \text{Vulnerability} / \text{Capacity}$.

Beyond expressing a probability of physical harm, it is crucial to appreciate that risks are always created or exist within social systems. It is important to consider the social contexts in which risks occur and that people therefore do not necessarily share the same perceptions of risk and their underlying causes.

S

Science, Technology and Innovation

Science, technology, and innovation include all forms of useful knowledge (codified and tacit) derived from diverse branches of learning and practice, ranging from basic scientific research to engineering to traditional knowledge. It also includes the policies used to promote scientific advance, technology development, and the commercialization of products, as well as the associated institutional innovations. *Science* refers to both basic and applied sciences. *Technology* refers to the application of science, engineering, and other fields, such as medicine. *Innovation* includes all of the processes, including business activities that bring a technology to market.

Shifting Cultivation

Found mainly in the tropics, especially in humid and sub humid regions. There are different kinds; for example, where a settlement is permanent, but certain fields are fallowed and cropped alternately ('rotational agriculture'). In others, whole settlements move and clear new land once the old is no longer productive. Also called 'swidden' (Old English for 'burnt clearing'), used more to designate the social group, or 'slash-and-burn', so-called because of the operations undergone.

Slash – and Burn Agriculture

A kind of shifting cultivation in high rainfall areas where the cropping period is followed by a fallow period during which grass, herb, bush or tree growth occurs.

OR:

A pattern of agriculture in which existing vegetation is cut, stacked and burned to provide space and nutrients for cropping; also called 'swidden' cultivation and shifting cultivation.

Smallholders

Smallholders are rural cultivators practicing intensive, permanent, diversified agriculture on relatively small farms in areas of dense population. The family household is the major corporate social unit for mobilizing agricultural labor, managing productive resources, and organizing consumption. The household produces a significant part of its own subsistence, and it generally participated in the market, where it sells some agricultural goods as well as carrying on cottage industry or other off-farm employment.

Social / Societal Learning Processes

Social learning processes imply normatively oriented transformations of face-to-face interaction between people acting as individuals or small groups. Societal learning processes refer to normatively oriented transformations of interaction between collective actor categories such as medium to large organizations that are relevant for the processes of structuring of the societies. Societal learning processes aim for the enhancement of the capacity of social organizations to respond creatively to new situations, constraints, and opportunities and to shape new trajectories for development.

Social Rate of Return

Social rate of return is the gain to society of a project or investment in net revenue divided by cost of the investment, expressed by percentage.

Soil and Water Conservation (SWC)

Soil and water conservation is a combination of appropriate technology and successful approach. Technologies promote the sustainable use of agricultural soils by minimizing soil erosion, maintaining and/or enhancing soil properties, managing water, and controlling temperature. Approaches explain the ways and means which are used to realize SWC in a given ecological and socio-economic environment.

Soil Erosion

The detachment and movement of soil from the land surface by wind and water in conditions influenced by human activities.

Soil Function

Any service, role, or task that a soil performs, especially: (a) sustaining biological activity, diversity, and productivity; (b) regulating and partitioning water and solute flow; (c) filtering, buffering, degrading, and detoxifying potential pollutants; (d) storing and cycling nutrients; (e) providing support for buildings and other structures and to protect archaeological treasures.

Spillover

A special type of beneficial externality. A spillover occurs when one person's investments in human capital increase the productivity of other people. Some types of spillovers also increase the rate of return to investments by others in their own human capital.

Stakeholder

An actor having a stake or interest in a physical resource, ecosystem service, institution, or social system, or someone who is or may be affected by a public policy.

Soil Quality

The capacity of a specific kind of soil to function, within natural or managed ecosystem boundaries, to sustain plant and animal productivity, maintain or enhance water and air quality, and support human health and habitation. In short, the capacity of the soil to function.

Subsistence

An activity in which the output is mostly for the use of the individual person doing it, or their family, and which is a significant component of their livelihood.

Subsistence Agriculture

Agriculture carried out for the use of the individual person or their family with few or no outputs available for sale.

1 Sustainability

2 A characteristic or state whereby the needs of the present and local population can be met without
3 compromising the ability of future generations or populations in other locations to meet their needs.

4 Sustainable Development

5 Development that meets the needs of the present without compromising the ability of future
6 generations to meet their own needs.

7 Sustainable Land Management (SLM)

8 This is a system of technologies and/or planning that aims to integrate ecological with socio-
9 economic and political principles in the management of land for agricultural and other purposes to
10 achieve intra- and intergenerational equity.

11 Sustainable Use of Natural Resources

12 Natural resource use is sustainable if specific types of use in a particular ecosystem are considered
13 reasonable in the light of both the internal and the external perspective on natural resources.
14 “Reasonable” in this context means that all actors agree that resource use fulfils productive,
15 physical, and cultural functions in ways that will meet the long-term need of the population affected.

16 Syndrome Context

17 A region or circumstances in which one or more syndromes of global change actually occur, or may
18 potentially emerge.

19 Syndrome Mitigation

20 Measures taken by individuals or institutions in one or more areas of intervention, which help reduce
21 the effects of single, or combinations of several core problems, thereby actually or potentially
22 reducing negative impacts of global change and contributing to sustainable development.

23 Syndromes of Global Change

24 Clusters of ecological, social, economic, and other problems or symptoms that form typical patterns,
25 are based on similar processes, and emerge in different regions of the world, thereby actually or
26 potentially resulting in adverse impacts at the global level.

27 Synergy

28 When the combined effect of several forces operating is greater than the sum of the separate effects
29 of the forces.

30 T**31 Technology**

32 Knowledge of the means and methods of producing goods and services, or the application of
33 science to production or distribution, resulting in the creation of new products, new manufacturing
34 processes, or more efficient methods of distribution.

35 Technology Transfer

36 The broad set of processes that cover the exchange of knowledge, money, and goods among
37 different stakeholders that lead to the spreading of technology for adapting to or mitigating climate
38 change. As a generic concept, the term is used to encompass both diffusion of technologies and
39 technological cooperation across and within countries.

40 Terms of Trade

41 The *international terms* of trade measures a relationship between the prices of exports and the
42 prices of imports, this being known strictly as the barter terms of trade. In this sense, deterioration in
43 the terms of trade could have resulted if unit prices of exports had risen less than unit prices for
44 imports. The *inter-sectoral terms of trade* refers to the terms of trade between sectors of the
45 economy, e.g., rural & urban, agriculture and industry.

46 Total Factor Productivity

1 Total factor productivity measures the increase in total output which is not accounted for by
2 increases in total inputs. The total factor productivity index is computed as the ratio of an index of
3 aggregate output to an index of aggregate inputs.

4 **Trade-off**

5 Management choices that intentionally or otherwise change the type, magnitude, and relative mix of
6 services provided by ecosystems.

7 **Transdisciplinarity**

8 A new form of learning and problem solving involving cooperation among different parts of society
9 and academia in order to meet complex social challenges.

10 **Transdisciplinary Approach**

11 A transdisciplinary approach in research integrates the social and natural sciences in a common
12 approach, and includes non-scientific knowledge systems in a participatory and interactive process
13 to improve societal practices.

14 **Transdisciplinary Research**

15 Research that integrates the social and natural sciences in a common approach, and includes non-
16 scientific knowledge systems in a participatory and interactive process to improve societal practices.

17 **Transformability**

18 Transformability is the capacity to become, or to create, a fundamentally different system when
19 ecological, social, and or economic conditions make the existing system untenable.

20 **U**

21 **Uncertainty**

22 An expression of the degree to which a future condition (e.g. of an ecosystem) is unknown.
23 Uncertainty can result from lack of information or from disagreement about what is known or even
24 knowable. It may have many types of sources, from quantifiable errors in the data to ambiguously
25 defined terminology or uncertain projections of human behavior.

26 **Undernourishment**

27 Food intake that is continuously inadequate to meet dietary energy requirement.

28 **Undernutrition**

29 The result of food intake that is insufficient to meet dietary energy requirements continuously, poor
30 absorption, and/or poor biological use of nutrients consumed.

31 **V**

32 **Valuation**

33 The process of expressing a value for a particular good or service in a certain context (e.g., of
34 decision-making) or value system, usually in terms of something that can be counted, often money,
35 but also through methods and measures from other disciplines (sociology, ecology, and so on).
36 Usually valuation processes are done by individual stakeholders or multi-stakeholder groups.

37 **Value**

38 Worth, desirability, or utility based on individual preferences. The total value of any resource, action
39 or object is the sum of the values of the different individuals involved in their use.

40 **Value Chain**

41 A value chain is a set of value-adding activities through which a product passes from the initial
42 production or design stage to final delivery to the consumer.

43 **Value Systems**

44 Norms and percepts that guide human judgment and action.

Vulnerability

The propensity of social or ecological systems to suffer harm from external stresses and perturbations. Involves the combination of sensitivity to exposures and adaptive measures to anticipate and reduce future harm

W

Water Cycle

The process by which water is transpired and evaporated from the land and water, condensed in the clouds, and precipitated out onto the earth once again to replenish the water in the bodies of water on the earth.

Watershed

The area which supplies water by surface and subsurface flow from precipitation to a given point in the drainage system.

Watershed Management

Use, regulation and treatment of water and land resources of a watershed to accomplish stated objectives.

Water Stress

A country is water-stressed if the available freshwater supply relative to water withdrawals acts as an important constraint on development. Withdrawals exceeding 20% of renewable water supply has been used as an indicator of water stress.

Water Productivity

Water productivity is an efficiency term quantified as a ration of product output (goods and services) over water input. The output could be biological goods or products such as crop (grain fodder) or livestock (meat, egg, fish) and can be expressed in term of yields, nutritional value or economic return. The output could also be an environment service or function. Water productivity can be at different scales and for a mixture of goods and services.

Expressions of water productivity. Three major expressions of water productivity can be identified:

1) the amount of carbon gain per unit of water transpired by the leaf or by the canopy (photosynthetic water productivity); 2) the amount of water transpired by the crop (biomass water productivity); or 3) the yield obtained per unit amount of water transpired by the crop (yield water productivity).

Agricultural water productivity relates net benefits gained through the use of water in crop, forestry, fishery, livestock and mixed agricultural systems. In its broadest sense, it reflects the objectives of producing more food, income, livelihood and ecological benefits at less social and environmental cost per unit of water in agriculture.

Physical water productivity relates agricultural production to water use – more crop per drop. Water use is expressed either in terms of delivery to a use, or depletion by a use through evapotranspiration, pollution, or directing water to a sink where it cannot be reused. Improving physical water productivity is important to reduce future water needs in agriculture.

Economic water productivity relates the value of agricultural production to agricultural water use. A holistic assessment should account for the benefits and costs of water, including less tangible livelihood benefits, but this is rarely done. Improving economic water productivity is important for economic growth and poverty reduction. (Suggestion Coates)

Welfare

The prosperity or, more broadly, the well being of a person or group.

Well-being

A context- and situation-dependent state, comprising basic material for a good life, freedom and choice, health, good social relations, and security.

X/Y/Z