

CGIAR MODEL MEGA PROGRAM

“IMPROVING THE RESILIENCE OF THE AGRICULTURAL SYSTEMS BY CONSERVING THE NATURAL RESOURCE BASE”

Explanatory Note: The document contains an outline of elements that may be considered in this megaprogram. It was intentionally designed as a large program cutting across a range of NRM issues rather than focusing on a single issue. The write up is illustrative, as a stakeholder process would be required to better define the program.

NEW WORKING TITLE:

Livelihoods and Ecosystem Services in Agricultural Landscapes

Context and Development Challenge

In the last 40 years the human population of the Earth has doubled, to about 6 billion. Today, the global economy has grown six fold, food production has increased about 2.5 times, water use has doubled, wood harvests for the pulp and paper industry has tripled, and marine fish stocks have been depleted. More land was converted to cropland in the 30 years after 1950 than in the 150 years between 1700 and 1850. So much so that cultivated areas now cover about 25% of the Earth’s terrestrial surface. Roughly 2.5 billion people still depend directly on agriculture, of which about 800 million are small farmers. There are several hundred million people engaged in artisanal fisheries or who are forest-dependent or pastoralists. Through 2040 it is estimated that fully 75% of the world’s poor will continue to live in rural areas, heavily dependent on degrading and scarcer natural resources for their livelihoods. Today, approximately 1.2 billion people have to contend with issues of water scarcity. Clearly we are facing major challenges to natural resources and the planet’s ability to provide ecosystem services for survival.

It is equally clear that piecemeal, short duration, unlinked approaches, as in the past, would only serendipitously make an impact on these ‘wicked problems’ of development. An integrated, impact oriented approach that explicitly situates the search for solutions in opportunities and challenges presented by dynamic complexity is required. A large scale, integrated, wide-partnership based programmatic approach is called for; the need is for a megaprogram.

This model Mega Program is therefore designed to engage a broad development-science-policy partnership to address the development challenges of water scarcity, land degradation, deforestation, loss of biodiversity, overfishing, and resulting vulnerability of communities. It considers the interplay between land, water, biota, financial, human and social capital with provisioning and regulating ecosystem services including food security and income. The entry point of this multi-scale model Mega Program is landscapes where agriculture is one of the main drivers of the degradation and loss of resilience of the natural resource base. For example, deforestation is driven largely by policies outside the forestry sector, including agricultural expansion. Land degradation destroys soils health, necessary for food production systems, development and the environment. Thus it also addresses the need to rebuild soil health. Agriculture is responsible for the diversion of 70% of the world’s total water withdrawals and the key driver of water scarcity. Yet agriculture is dependent on the

sustainable management of natural resources, and therefore must be more adaptive in the face of uncertainty in a rapidly changing world.

The CGIAR Centers are uniquely placed at the nexus between agriculture and natural resources management – from successes of feeding the world in its commodity oriented centres, through a deep understanding and successes in integrating agriculture productivity into sustainability and equity goals that the ecoregional and natural resources Centres have delivered – to act as the boundary spanning organizations that can, with its extensive networks of partners, bridge between the twin demands of feeding the world and securing its ability to sustain livelihoods and life under severely challenging circumstances. The CGIAR Centers have been at the heart of averting major hunger catastrophes in the past, and are at the heart of deliberations on how to manage land, carbon, water and other resources more efficiently and sustainably at present.

The model Mega Program addresses the need to reverse degradation of ecosystem services in multifunctional landscapes, and tradeoffs incurred when using the natural resource base of water, land, atmosphere, and biodiversity for food production and income generation. Accordingly, results will be used to guide policies and investment strategies to bring about change in the management of natural resources and agriculture to improve livelihoods and ecosystem health. It includes issues of policies, institutions, and political ecology including gender, power relations, and access to resources. It will consider drivers of change including global trade, urbanization, climate change, and energy demand. Choices will have to be informed as to which ecosystem services should be traded off against each other, in other words whether we choose multi-functional, diverse or highly specialized landscapes in particular cases and what the implications might be for intensification, efficiency and sustainability strategies.

We recognize the role of plant breeding in building resilience and therefore the need to maintain active and dynamic links between this Mega Program and others that focus more on breeding and crop development. The implication of this is that plant breeding will not be an objective or a theme in this model Mega Program, rather this program deals with integration at the landscape scale, in which plant breeding may have an important role.

Comparative Advantage and Opportunities: the Added Value and what's New?

Taking an integrative approach in terms of landscape and partnerships will yield impact to a degree not yet realized by NRM research. Research on managing natural resources and key ecosystem services have been a key part of the research of the CGIAR centers, and a number of other national and international organizations. This work has produced useful outputs but it has neither been adequately integrative and coherent across the various initiatives, nor has the nature, scope or scale of the partnerships employed been conducive to translating the research into large development outcomes. The proposed model Mega Program will build upon the positive outcomes of this past research, and deepen elements of integration and partnership.

Integration and Coherence

The research integrates issues of resource management within a landscape to find opportunities that would otherwise be missed when looking at the problem from a perspective of a single resource. This research will take a landscape approach in which particular management options, intervention zones and hotspots will be identified for research. The key

elements of natural resources impacting on development challenges faced in these defined domains will be studied, with a view to improving livelihoods through improved sustainability, efficiency and productivity of this system. This will involve integrative research involving dimensions of key ecosystem services within the wider landscapes, as well as socioeconomic and policy considerations, in order to reduce vulnerability of human populations.

Strategic Partnerships

The full development of this Mega Program requires the involvement of a broad spectrum of partnerships to translate science into development to address critical development challenges. New and dynamic forms of partnerships will be required, involving the CGIAR centers and other relevant research, development and policy partners at different levels and scales (international, regional, national and local organizations) as well as thematic expertise (land, water, biota, etc.). Involvement of partners will therefore be required from the very beginning of development of the model Mega Program, right through its implementation, and also in the monitoring and review of progress. The model Mega Program will allow for changes in partnership configuration to be able to address key issues as they arise.

CGIAR centers would be expected to play catalytic and interfacing (boundary spanning) roles in engaging these organizations, based on its global knowledge and experience of agriculture and natural resource systems. The CGIAR system contributes and leverages the data sets and evidence base that it has generated over years and which is available to impact on the development challenges. The new CGIAR Consortium presents the opportunity, and has a capacity, to bring the larger environment and climate change community, combining and building on strengths of both communities.

Scope of the Program

The scope of this Program is essentially bounded by the development challenge presented by environmental problems of scarcity and degradation of key resources and ecosystem services as they impact on livelihoods, especially the vulnerability of people who live in agricultural and forested landscapes. In this regard the program will address issues on sustainable use and management of natural resources; sustainable intensification; and sustainable diversification in agricultural and forestry systems, aimed at enhancing livelihoods and promoting environmental health.

The *impact thesis* underpinning this Mega Program is: Practices and policies that result in more robust landscapes will deliver a more reliable stream of long-term benefits from ecosystem services for people. This will result from addressing science challenges related to developing a better understanding of complex interactions. This increased understanding will lead to applications that will be developed and tested to deal with major development challenges.

Geographic scope – multiple nested scales: This Mega Program considers hotspot issues of degradation and scarcity, and will operate in “NRM hotspots” sites with an entry point at the landscape scale. It will consider multiple nested scales, reflecting the insight that it is important to ‘right-scale’ research to the scale of the problem, opportunity or change process that is at the heart of the objective of the research. This could in some cases involve nesting

research from the plot, through the farm, village, watershed, through to the country region, or even global scales.

In order to make the research in the model Mega Program tractable, targeting criteria would be used by the partnership to jointly identify areas of work. These may be at the confluence of several ecological, social and economic 'hot spots' of relevance to agriculture and natural resources management. Possible targeting criteria (incomplete list at this stage of the design process) include maps of poverty soils, land degradation, human health, productivity and factors influencing these; outcome and concurrence of global circulation models; occurrence of migration and conflicts; biodiversity hotspot analysis; and institutional capacity; and possibility of co-locating with partners. Example hotspot areas include: Amazon basin, African highlands, Congo forest basin, mountain mainlands south-east Asia, Andes, hillsides meso and south America, inland valleys Africa, intensive cereal-based agro-ecosystems, pastoral lands, desert margins, aquatic ecosystems, degraded forests, drylands, water scarce river basins such as those in the present Challenge Program on Water and Food.

Program Objectives and Timescale (5 &10 years)

Program Goal: Sustainably improve livelihoods, ecosystem services and agricultural productivity and efficiency in landscapes.

Objective 1 (science): Identify options, baselines, tipping points, risks, opportunities, strategies and technologies to reverse trends of scarcity, degradation and vulnerability in selected landscapes. This will involve improving current abilities to analyze and anticipate, in an integrated manner, the impact of various drivers of change on the delivery of ecosystem services and livelihoods. The Mega Program will support cross scale, inter and trans-disciplinary research, covering many methodologies and creating new paradigms. This would involve development of tools and methods for scenario analysis, impact monitoring, early warning, trade-off analysis and identification of possible critical thresholds and tipping points, among others.

Objective 2 (policy): Contribute to practices, institutions and policies that result in landscape scale improvements to scarcity, degradation and vulnerability. Specifically the action research will seek to improve capacities to adapt, cope or mitigate the impact of drivers of change in selected landscapes.

Objective 3 (capacity): Develop human and institutional capacity to effect meaningful change at the landscape and global scales in order to deliver the result of this model Mega Program and similar results outside of the scope of the model Mega Program. This requires the forming of an evidence-based science-policy-development partnership.

Intended Program Achievements

Results (outputs):

- Methodologies developed and analysis performed to unravel complexity and to provide evidence for policy
- Baselines, thresholds, analyses, and tipping points for environmental and livelihood variables.

- Broad partnerships established to carry out research, to deliver policy messages, to implement change.
- Communication and knowledge sharing to engage in policy setting and capacity building.
- Capacity building of institutions to integrate knowledge across sectors, and of researchers to provide evidence to policy processes.

Outcomes:

- Practices changed at landscape “hotspot” areas as informed by research.
- Institutional arrangements that better integrate across sectors and scales established.
- Policies from local to global scale influenced by Mega Program work
- Investments into supporting the development objectives of the Mega Program made.

Impact (5 years and beyond):

- Robust and better function ecosystems in 100 to 500 Million ha of land
- Poverty reduced – on the order of 10 to 100 million people
- Human well-being including nutrition, health, income of 100 to 600 million people improved

(The numbers show an order of magnitude, and would have to be based on better analysis depending on the hotspot shown)

Pathways (and partners) linking outputs to outcomes and impact

Program design would require that institutional structures are set up to promote impact pathways which would facilitate the uptake and use of component project parts. For example, the program would set up links to the development community and policy makers and fit together individual project components, relieving that responsibility from component projects. Most of the institutional participants along the impact pathway are included in the project partnership to facilitate impact.

At “NRM Hotspots”

- Information (researchers) to policy makers and practitioners (government, NGOs, extension, landscape planning agencies, water agencies) with policy makers and practitioners informing research agenda.
- Local participating partners instigate change, creating a learning environment with communities.
- Use field and research evidence to engage and inform policy makers at global scales
- Large scale ‘action-research’ e.g. inserting evidence based policy into agricultural intensification projects of AGRA in their ‘sustainable green revolution’ program in 4 selected ‘bread-basket’ countries in Africa.

At Global Level

- Target various organizations to instigate change including major investors such as the development banks and donors) at global and local scales using information base derived from local to global experience
- Influencing the research agenda through publications and conferences

Proportion of MP investment in research outputs vs investments in outcomes

The funding partition would be on the order of 50% for research, and 50% to support development outcomes (CGIAR would do 80% research and 20% development outcomes).

An important strategy is to leverage more development fund into the agenda, and also to obtain more research funding to support the research and development link.

Program Content

Topics

A number of topics will be addressed, depending on the nature of the hotspot, including integrated research at multiple, nested scales, on selected themes such as:

- Production systems including fisheries, forestry, aquaculture, livestock, crop and mixed systems in irrigated, rainfed, and other ecosystems.
- Water availability, access, use and productivity, and health and environmental consequences from farm to river basin scales;
- Land use planning, land tenure, land degradation assessment, land rehabilitation, soil health
- Conservation agriculture and organic agriculture
- Terrestrial and aquatic biodiversity as they influence the sustainability, efficiency and resilience of agricultural landscapes
- Renewable energy demand, and sources of energy
- Climate change and other key drivers of change
- Political ecology and institutions, including innovative schemes and incentives that appropriately value ecosystem services
- Gender and power relations and socio-economic considerations

To be effective, the Mega Program must retain focus, and not try to cover all issues at the same time, rather key relevant issues, at the right mix of scales must be selected. As the MMP progresses, certain issues could be dropped and others added, reflecting increased understanding and the dynamic nature of NRM.

Program Themes

Program themes tie together lessons drawn from hotspot issues and their field sites, and global analysis. They serve to integrate the Mega Program and to help investigate cross cutting issues across diverse sites. An indicative initial list includes:

- **Tradeoffs:** What tradeoffs are incurred when using the natural resource base of water, land, and biodiversity for food production and income generation? Methods are required to analyze linkages, values, and tradeoffs.
- **Climate Change Mitigation and Adaptation:** Impacts on carbon budgets of resulting from changes in investments, practices, technologies, institutions ...
- **Institutions:** How can new institutional arrangements (gender, access rights, decision making, policies, etc.) lead to desired outcomes.
- **Gender:** Analysis of present relationships, how change may impact these; and ensuring that development changes are appropriately targeted for the best outcomes including equity.
- **Health:** How can change support improved human health?
- **Drivers and Trends:** What are trends in drivers of change including global trade, urbanization, climate change, energy demand, etc. and how are they likely to impact water use, forests, etc.?

Program Implementation

Partnership: The MMP requires a comprehensive research-development-policy partnership with the following participant categories:

- *CGIAR centers:* for research, knowledge sharing and catalyzing partnerships, merging elements of existing Challenge Programs.
- *Other Research Partners-* universities, advance research institutes, sub-regional organizations (e.g. ASARECA) for research and outreach
- *Global Policy Arena-* Global conventions and related bodies, UN Organizations, other multi-lateral organizations: for changes in the global agenda.
- *International and National NGOs:* for advocacy, co-located studies and linking conservation and development goals
- *Investors:* bi- and multilateral donors, foundations, private sector: to provide input to the program from a donor perspective, and ultimately to fund pieces of the MP and its associated Agenda.
- *Regional Policy Arena:* Regional Economic Forums, regional partnerships, networks and commissions, to help set the Agenda, and set policies to support it.
- *Intervention zone & NRM hotspot area research, policy and development players:* government, universities, national agriculture research and extension services, NGOs, private sector, to carry out development activities in support of livelihoods and ecosystems.

Program Governance and Management and Partnerships

Two management tiers are envisaged, one tier handling global scale plus integrating themes, and another tier managing work of ‘hotspot’ issues and sites (water scarcity, deforestation, land degradation). The second tier would be managed by three or four centers, each one responsible for a hotspot issue and a set of hotspot sites. A transition period is envisaged where the CGIAR center role in managing contracts is ultimately handed to the Consortium when it becomes functional.

Business Model

Two business models are considered to handle the transition into the Consortium over a 5 year period. (See Annex with Figures 1-4 for a graphic explanation)

Initial model: The Consortium allocates funds to an Mega Program lead center representing an association of partners inside and outside the CGIAR. A lead center will be identified for overall coordination, coordinating the global work, and leading the thematic work, and other participating centers will be allocated responsibilities for leading research in identified NRM hotspots. To mobilize a large number of partners both inside and outside the CGIAR, the Mega Program will have the following governance arrangements.

An Association Steering Committee – of about 10 partner representatives drawn from key development, research, policy and investment partners representing the interests of the program participants. The role is to set a shared research for development agenda by contributing to overall strategy, and to advise the Mega Program management team on the scientific workplan and its implementation. Certain Association organizations will lead components (based on hotspot issues) and be responsible for handling major subcontracts to partners and leading work at hotspot areas. Association representatives would change over

time as the program evolves. Other Association members and stakeholder may bring their own funding (which they manage) in support of the model Mega Program program agenda.

A Management Team with a Leader – to develop the business and strategic plan, set milestones and success indicators, monitor and evaluate individual sub-projects, provide science and impact leadership, and oversee workplan implementation. The management team would be organized to handle themes, and hotspot work. They may include seconded staff from CGIAR centers.

Lead Center – is responsible for initiating and driving a successful program, and thus requires a significant role in program management and oversight including provision of a program director. The lead center initially holds fiduciary and financial responsibility for the program, and handles contracts and finances following Management Team decisions, and provides a secretariat providing administrative support (HR, finance, communications). An appropriate level of checks and balances and monitoring and evaluation is required to ensure adequate participation and reduce conflicts, and these are provided by the Consortium's monitoring and evaluation role and the Steering Committee. Similar roles are to be devolved to the three to four centers leading hotspot issues.

The Association – consisting of 200+ partner representatives from development, policy, research, investor organizations and is the group to carry out the Program. Partner organizations will carry out the research to development agenda, carry out research, do community outreach, be involved in policy advocacy, and engage in knowledge sharing. Partner organizations will have a voice in priority setting through the links with the Steering Committee. Some of the organizations will receive contracts to carry out the work either from commissioned or in cases where new expertise is sought, be competitively sought. Others will contribute funding and projects to agenda set by the program.

Consortium – initially carries out monitoring and evaluation of the overall achievements of the Mega Program, approves business and strategic plans.

After Transition: Consortium handles contracts and other administrative support in addition to monitoring and evaluation functions. Lead centers (main and hotspot) will keep their role in managing the science for development aspect of the Mega Program.

The Mega Program will migrate to this option once the Consortium is ready to handle all contracting for the centers and all participating partners, especially given the large number of partners that will be engaged in the Mega Program. Under this option the Consortium is expected to undertake independent monitoring of the Program. Moving towards this option assumes at least 80% of the Consortium funding is flowing through the Fund and that the Consortium has developed the required capacity.

Budget and Funding Arrangements

The CGIAR sponsored Centers currently invest between 25-30% (About \$150 Million) of their annual budgets into NRM related work. This Mega Program rationalizes these activities and funding arrangements. It is anticipated that the Mega Program will start with a funding level of \$50M from the Consortium to support the Mega Program agenda. In addition, during the first 5 years the Centers will continue to raise bilateral funds to support specific elements

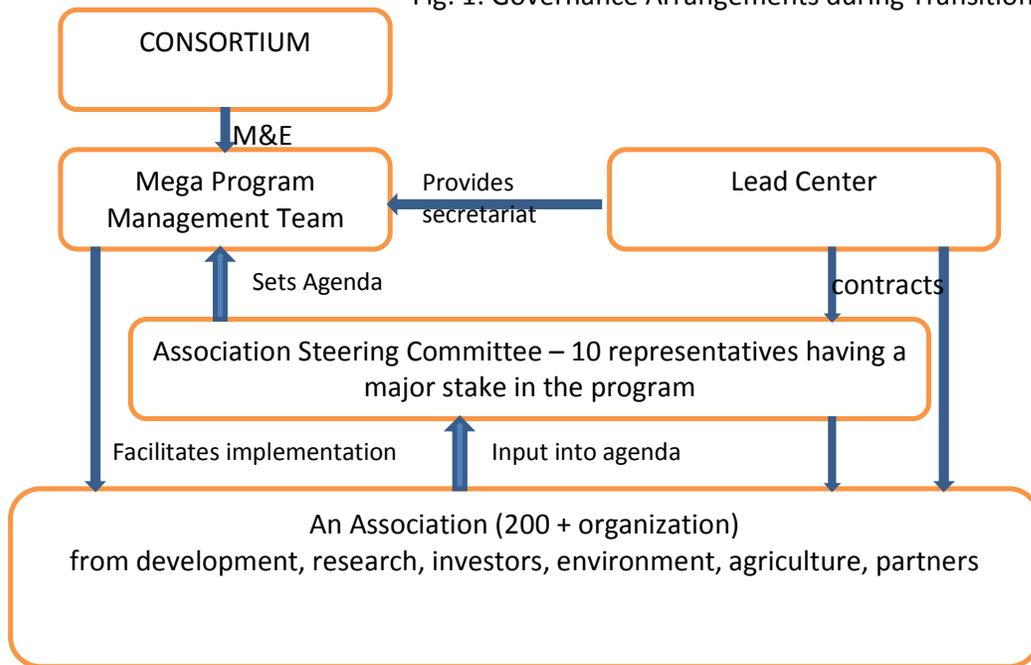
of the Mega Program. After 5 years the funding from the Consortium is expected to grow to \$150 Million per year to support the research to development program, moving to a situation where most funds are allocated to the entire program through the Consortium, rather than bilaterally funding its elements.

This budget, representing roughly the current investments of the participating centers, is expected to help leverage – or be leveraged through – considerably greater partnership funds from partners who are focused on the delivery of development outcomes. The CGIAR’s contribution to NRM will only be effective if international investors (e.g. IUCN, GEF implementing agencies) and governments are able to increase funding to implementation of development outcomes that are linked to the jointly developed agenda of the Mega Program (and the CGIAR).

At the end of 10 years funding to the Mega Program by the Consortium is expected to be \$200 representing 80% of the entire Mega Program budget channeled through the Fund. In addition to this budget, the Program will leverage additional extra budgetary funding to support development activities.

ANNEX

Fig. 1: Governance Arrangements during Transition



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Fig. 2: Governance after Transition

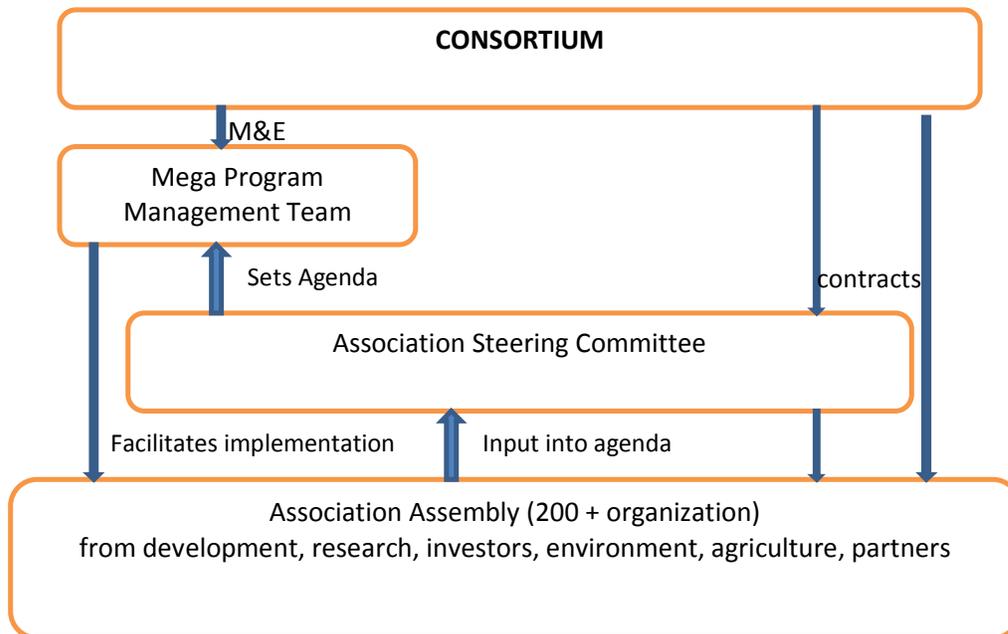
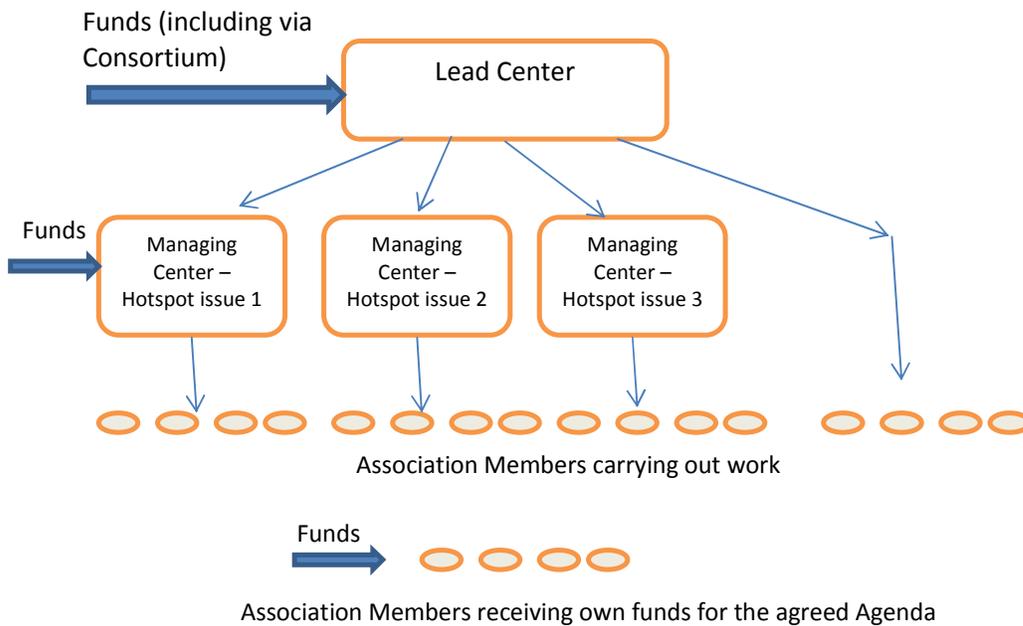


Fig. 3: Money Flows – Initially



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Fig. 4: Money Flows – After Transition

