

Sustainable Livelihood Community Level Assessment of Wayanad, Kerala

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ABSTRACT

This needs and capacity building assessment examined environmental, economic, and social conditions at a community level in Wayanad, Kerala, India, to document community-identified challenges, existing assets, as well as unmet needs. Sustainable livelihood security at the household level was assessed using purposeful sampling of select vulnerable groups prioritizing women, tribals and agricultural workers through surveys and focus groups. Interviews with seven local non-profit leaders further document existing services and programs within the community. Wayanad faces challenges including land use change, a lack of waste management, gender inequality, and unfavorable market conditions, particularly for farmers. The district has an existing network of capable organizations dedicated to sustainable living that are well connected to government planning and funding. Demand for increased services and programs can expand on the existing capacity within the community to address Wayanad's challenges. Additional focus on program goals aimed to increase dignity and empowerment are recommended.

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**SUSTAINABLE LIVELIHOOD COMMU-
NITY LEVEL ASSESSMENT OF
WAYANAD, KERALA**

INTRODUCTION

In March of 2014, I had the opportunity to volunteer on the Green Gardens Farm in Kerala, India, through the World Wide Opportunities on Organic Farms (WWOOF), an organization that links volunteers with organic farms and growers. I spent three weeks on the farm helping to clear a field to be planted with cardamom, move building material, plant beans, pick tea leaves, and landscape a portion of the property. More importantly, I got to know the managers of the farm and the workers who brought it to life, experiencing the rich culture of this area, primarily through food. I ate breakfast and dinner each night with one of the plantation workers and her husband and slowly came to know more and more of the community in which I was so warmly welcomed. It was while working at this farm that I was accepted to Tufts University's Master of Urban and Environmental Policy and Planning. After three weeks I left the farm with a peaked interest in the socioeconomic conditions of the agricultural community of the Global South, and in particular the social conditions for woman in the region.

After returning back to the United States, I remained in contact with the operators of the farm as they developed the programs for their foundation, The Golden Greens Foundation Charitable Trust (TGGFCT). It was clear to me from the first conversation I had with Laiju, the Chairman of TGGFCT, that the Trust was dedicated to the very same goals (sustainability, equality, and empowerment) that had pushed me to pursue my master's degree in the first place. Thus, I began to assist the organization with tasks from abroad, such as editing their website and providing feedback on their mission and value statements, while taking classes for my masters degree. While at Tufts, I explored concepts related to sustainable development with a particular interest in innovative practices to ensure water and food security such as agroecology, aquaponics, low impact development, and land use. While working with TGGFCT, I was able to apply some

of the tangible skills I was gaining in my masters by assisting the organization. After a year of communication, I was invited to be an advisory member of the trust. Soon after, I decided to return to volunteer for the organization as an intern for my master's degree. While preparing for my return visit, I was in consistent contact with the Chairman of TGGFCT, who was interested in pursuing a research project to identify potential beneficiaries of the trust's programs and assess community needs. It was through this continued relationship built from an initial cultural exchange that this project originated.

I entered into this project, wanting to gain as much information as I could about the community of Wayanad, Kerala where TGGFCT and the farm are based. I wanted to know what the greatest challenges related to environmental, social, and economic conditions facing the community were and how to best prepare myself as a working member of TGGFCT to address some of these challenges. As a white, privileged, and vegetarian female from the United States, with a passion for the environment, yoga, ayurveda, and sustainable food systems, I am aware that my positionality inherently shaped and influenced the development of my research questions and goals. It was my intention to learn directly from community members, particularly those whose voices often go unheard, and create a platform to share their opinions within the community. I continue to be involved with TGGFCT as a working committee member and aspire to continue to support some of the powerful sustainability initiatives occurring within the region.

FOOD SECURITY, FOOD SOVEREIGNTY, AND SUSTAINABLE AGRICULTURE

“Pressures on food prices are likely to continue since they are exacerbated by volatile market dynamics, inadequate global coordination and the multiple effects of population growth, energy markets, climate change, land degradation and water scarcity.”

-Food and Agriculture: The Future of Sustainability. The Sustainable Development in the 21st century (SD21) Report for Rio+20, New York: United Nations, 2012

Globally, we continue to grapple with the challenge of feeding our growing population, however, the ways in which we approach this task has drastically shifted since the 1940s, and has been central to transforming international development policies. I will attempt to explain some of the transformations of global agricultural development, hunger, and food security; as well as explain the transition to a new phase of agricultural development that emphasizes sustainability and agroecology.

In the 1960s and 1970s a series of research and technological advancements were developed, otherwise known as the Green Revolution, which aimed to increase crop production through the use of fertilizers, pesticides, and high-yield crops (Barbier and Conway 1990). The Green Revolution was credited with saving the world's developing countries and supplying the world with enough food by promoting industrial agriculture (Barbier and Conway 1990; Bourne 2009). However, more recent literature suggests that the Green Revolution and the shift to high-input fossil fuel based agriculture has resulted in unintended economic and social consequences (Barbier and Conway 1990; United Nations 2009; Wise and Murphy 2012) and possibly produced just as many hungry people as it supposedly saved (Lappé and Collins 2015; Holt-Gimenez 2011).

Industrial agriculture, combined with trade liberalization and global food policies pushed many farmers to switch to monoculture cash cropping beginning in the 1960's. It promised agricultural prosperity by promoting production for export as opposed to food production for domestic markets. Many food experts now argue that the Green Revolution actually made many rural farmers, particularly in developing countries and the Global South, extremely vulnerable to glob-

al market price volatility and often times food-insecure themselves (Holt-Gimenez 2011; Lappé and Collins 2015; Wise and Murphy 2012). In order to promote globalization and trade liberalization, global food agencies abandoned agricultural subsidies and tariffs that favored developing countries, thereby weakening many nations' capacity to encourage local production. These same organizations such as the World Bank simultaneously promoted the sale of enormous areas of public land thereby displacing many small farmers (Lappé and Collins 2015), while also using conditional aid to shift farmers towards a reliance on chemical inputs and hybrid seeds. As a result, private property contracts were strengthened that privileged corporations over small farmers (Lappé and Collins 2015), contributing to what Holt-Gimenez (2011) describes as the "corporate food regime" (310), which still continues to date.

In the year 2000, the United Nations (UN) established the Millennium Development Goals which outlined a fifteen year plan to eradicate poverty, setting a goal to halve the number of people who suffer from hunger by 2015. While many organizations arose to take up the feat, they were faced with a new set of challenges when, from 2005-2008, the world experienced the first phase of the global food crisis. During this time, the price of wheat and corn tripled while rice increased fivefold, spurring food riots in nearly two dozen countries and forcing around 75-130 million people into poverty (World Bank 2016; Bourne 2009; Wise and Murphy 2012). The second phase of this crisis occurred in 2011 when the Food and Agricultural Organization's (FAO) world food-price index rose to a record high, surpassing the previous all-time high set in June 2008 (United Nations 2011). It is estimated that the crisis caused 5.1 million people to be at risk of moderate food insecurity (United Nations 2011). According to experts, some of the contributing factors to the food crisis included: rapid increases in the use of agricultural crops and land for energy, increasing demand for feed crops as diets shift to include more meat and fish;

low levels of publicly-held inventories of key food crops, trade and food aid policies through the World Trade Organization (WTO) that weakened developing countries' food-production capacity, weather-related interruptions to supplies in key exporting countries; reductions in agricultural research and development, and increased financial speculation in agricultural commodity markets. (Lappé and Collins 2015; Holt-Giménez 2011; United Nations 2011; Wise and Murphy 2012). Holt-Giménez (2011) argues, however, that the root cause of the global food crisis was the monopolistic concentration of power in the food system, which made Southern countries and poor people everywhere highly vulnerable to economic and environmental shock (312). There is no doubt that the food crisis and its contributions to global unrest made food security an issue of unparalleled global concern (Bar-Yam et al. 2011). This recognition caused a paradigm shift in which many nations and international organizations, such as the United Nations, World Bank, FAO, and the World Health Organization (WHO), have become particularly concerned with food security (Wise and Murphy 2012) and strategies to achieve it.

The most inclusive up to date working definition of food security is that refined by the FAO's State of Food Insecurity in 2001 and published in the 2015 Hunger Report, which defines it as a situation when "all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life" (sec: Glossary). Currently, over 164 nations have accepted international law which commits the right to food for their citizens and more than two dozen nations have now included an explicit right to food into their constitutions, one of which is India (Lappé and Collins 2015).

However, the current state of our global food system proves to be worrisome. Currently three companies own 65 percent of the global seed market (Monsanto, DuPont, and Syngenta),

selling patented seed varieties at the expense of farmers (Lappé and Collins 2015; Holt-Gimenez 2011). Meanwhile, agriculture remains the largest employer in the world, particularly for poor rural households. Five-hundred million small farms worldwide, mostly rain-fed, provide up to 80 percent of most of the developing world's food (United Nations 2016). Even more worrisome is that climate conditions, water stress, extreme weather events, and their predicted intensification due to climate change place farmers and agricultural workers in a more vulnerable situation to debt and distress (Lappé and Collins 2015; Holt-Gimenez 2011; United Nations 2009).

The recognition of this link between agricultural workers, particularly of the global south and global food security has only become stronger. In developing their new Sustainable Development Goals (SDGs), the United Nations recently called for their second goal of Zero Hunger, which they hope to achieve by promoting sustainable agriculture and improving nutrition (United Nations 2016). They specifically mention the need to “double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers”. The UN also notes the need to strengthen capacity for adaptation to climate change, maintain the genetic diversity of seeds and plants, and invest in rural infrastructure (United Nations 2016) in order to achieve the goal. Academic experts on the topic have been promoting a shift towards the integration of agricultural, economic, and natural resource markets (Wise and Murphy 2012) as well a recognition of the nexus between energy, food, and water systems (National Science Foundation 2014; FAO 2014) in order to address both food and water security. More noteworthy is the recognition that “hunger is not the result of the scarcity of food but the scarcity of democracy” (Lappé and Collins, 2015), which highlights the connection of food systems to larger developmental goals as well as the role of governance in addressing hunger. Public policy expert Thomas Dye (2008) notes that politics can be defined as “who gets

what and when” and that “public policy is whatever governments choose to do or not to do” (1-2). The Sustainable Development Goal of Zero Hunger is just one policy example of governments choosing to do something related to development and hunger.

Achieving food security and other development goals have become very linked over the past few years. A six year study published in 2009 by the United Nations, the "International Assessment of Agricultural Knowledge, Science and Technology for Development (IAAKSTD)", concluded that there needs to be increased importance placed on the “complexity of agricultural systems within diverse social and ecological contexts” (4). The report called for an integrated development approach that considered a broad range of livelihood influences such as equity, gender, local knowledge, environmental sustainability, human health and nutrition, and governance (United Nations 2009). Sustainable agriculture and agroecology have since gained significant momentum and are seen as important strategies to create sustainable and just communities through the empowerment of local people (Agyeman 2014; Lappé and Collins 2015). Food sovereignty, treating food as a human right and reorienting production to prioritize self-sufficiency, is a key strategy to promoting food security (Lappé and Collins 2015; FAO 2015; Baviskar et al. 2014; Agyeman 2014). It can further be defined as the right of people to define their own food and agricultural systems in order to put those who produce, distribute, and consume food at the heart of food systems and policies rather than at the demands of the market and corporations as well as a way to ensure people to healthy and culturally appropriate food produced through ecologically sound and sustainable methods (Lappé and Collins 2012; Baviskar et al. 2014). Lappé (2015) highlights the importance of dignity and empowerment in agroecology initiatives, describing that there are three essential things people need in order to experience dignity: connection with others, meaning in our lives, and power (a sense of agency in creating our own

destiny). Empowerment has become an increasingly relevant term in development literature (Dearden 2004; United Nations Development Program 2009) as well as capacity development, as indicated by Figure 1 below. The World Bank (2016) defines empowerment as the “process of enhancing the capacity of individuals or groups to make choices and to transform those choices into desired actions and outcomes.” The actions that both build individual and collective assets and improve the efficiency and fairness of the organizational and institutional context which govern the use of these assets are central to this process of empowerment (World Bank 2016). The World Bank identifies four key elements which are essential for empowerment in their 2002 Empowerment Sourcebook: (1) Access to information, (2) Inclusion/Participation, (3) Accountability, and (4) Local organizational capacity. The sourcebook also highlights the importance of changing unequal institutional relationships of both formal and informal institutions (laws, organizations, and cultural norms) by including the participation of poor and excluded groups such as women into the policies and culture of these institutions (World Bank 2002).



Figure 1: Evolution of UNDP's Capacity Building Framework (UNDP 2009)

According to the literature, there is growing concern of global importance regarding food security and our food systems, which was spurred by the 2008 and 2011 food crises. There is a growing consensus that the corporate monopolization of our food system, and the transition to industrial agricultural practices has hindered our ability to address malnutrition in all of its forms (Lappé and Collins 2015; Holt-Gimenez 2011; Wise and Murphy 2012). This caused a recent paradigm shift towards holistically viewing our food systems as an integration of complex envi-

ronmental, social, and economic systems (Wise and Murphy 2012). Agroecology, food sovereignty, and sustainable agriculture have all been identified as important strategies not only for addressing food security, but also increasing capacity and human dignity through the empowerment of individuals at local levels (Agyeman 2014; Lappé and Collins 2015; Holt-Gimenez 2011). Governance and policy play key roles in capacity development (World Bank 2016; Dye 2008; World Bank 2002) more should be done to increase democracy and participation in order to decrease hunger (Lappé and Collins 2015; United Nations 2016); international agencies, national governments, academics, and non-governmental organizations (NGOs) are committing to make food security a reality by 2030 through increased funding and services (United Nations 2016). In order to achieve the second Sustainable Development Goal of Zero Hunger, it is widely believed we need to empower communities, increase capacity, and invest in the dignity of small and rural farmers, with a particular focus on women and indigenous populations (United Nations 2016; United Nations 2009; Lappé and Collins 2015). These thoughts and ideologies greatly shaped and influenced my research interests as well as my evaluation design.

THE LOCAL CONTEXT



Figure 2: Wayanad's location within India¹

India is one of the primary locations that food security initiatives target given its largely agricultural-based economy and elevated levels of malnutrition and poverty (India 2011 Census, Global Hunger Index 2016, Human Development Indicators 2016). In order to explore the concepts of food security, the impacts of the industrial food regime, and the conditions that farmers of the Global South face on a local level, I decided to return to the small agricultural village in Wayanad, Kerala, to conduct research.

Before embarking on this research project, it was imperative to understand the community and local context in which the research would take place. I will first discuss my findings about the local conditions for India as a whole, then the state of Kerala, and more specifically the district of Wayanad, in which this project took place. I will highlight concepts related to develop-

¹ Cartography by Allison Platt, December 10, 2015. Data from Tufts GIS Lab, and TGGFCT location coordinates)

ment, gender, the environment, agriculture, food security, as well as vulnerable populations and communities.

INDIA

India is the second most populated country in the world, with a total population of 1.2 billion people (India Census 2011). Of this population, 36 percent are illiterate (India Census 2011), 15.2 percent are malnourished (Global Hunger Index 2016), and 51 percent are living in a state of poverty (Human Development Indicators 2016). In 2015, India topped the world hunger list with 194 million hungry people (The Hindu 2015).

India has also been noted for its high levels of inequality (The Hindu 2014; Human Development Index 2016), which can be traced back to its caste system and marginalization of “untouchables”, also known as *Dalits*. While the caste system was abolished in India in 1950, there are still a large number of disadvantaged groups that remain. The government of India keeps records of certain castes (determined by family name) which are considered to be disadvantaged and therefore qualified for certain public programs which include: “scheduled castes” (SC), “scheduled tribes” (ST), and “other backward classes” (OBC). All affairs that pertain to these three groups are overseen by the Indian Ministry of Social Justice and Empowerment (Ministry of Social Justice 2016).

Agriculture is the largest livelihood provider within India, especially in rural areas (National Portal of India 2016). In a study by the Ministry of Statistics & Programme Implementation, it was found that approximately 45 percent of agricultural households in India belong to the Other Backward Classes, 16 percent to Scheduled Castes, and 13 percent from Scheduled Tribes. This signifies that 74 percent of agricultural households in India belong to disadvantaged groups

(Ministry of Statistics & Programme Implementation 2014). Therefore, agricultural reform in India is crucial for social reform.

India in the 1960's was the primary testing ground in the Global South for the Green Revolution and Industrial Agriculture. Lappé provides an example of the detrimental effects of the Green Revolution in India by referencing a 2007 report by the Punjab State Council for Science and Technology. This report evaluated the effects of the Green Revolution hybrid seeds and chemical inputs on the Punjab region of India after forty years of industrial agricultural practices, and found that the area was experiencing a variety of environmental concerns. The results demonstrated that the over intensification of agriculture resulting from the transition to high input agriculture included groundwater depletion, reduced soil fertility, micronutrient deficiency, pesticide residues, soil erosion, reduced biodiversity, as well as air and water pollution (Lappé and Collins 2015; Bourne 2009).

The transition towards Industrial Agriculture did not help farmers either. India, especially in the early twenty first century, was experiencing a country-wide phenomenon of agrarian distress and farmer suicides due to high levels of debt (Lappé and Collins 2015; Sharma 2012; Umar 2015; Becker 2015; Barpujari and Birumore 2015). Agrarian Distress, is a term typically used to describe the increasing number of farmer suicides within India over the past twenty years and the socio-political, economic, and environmental conditions causing this phenomena. Agrarian Distress has been said to be caused by indebtedness, lack of land ownership, crop failure, and lack of rural development and government support for the agriculture sector (Sharma 2012). There have been over 300,000 farmer suicides in India from 1995-2014 (Sainait 2014; Umar 2015), with 5,650 occurring in 2014 alone (National Crime Records Bureau 2015). The Suicide Rate among Indian farmers is 47 percent higher than the national average and 52 percent of In-

dia's agricultural households are indebted (Ministry of Statistics & Programme Implementation 2014).

Despite the intense situation Indian farmers find themselves in, there are many organizations interested in promoting sustainable development and creating sustainable livelihood opportunities for vulnerable populations within India, in particular through agroecological practices. While globally organic farming has only doubled, in India it has increased eightfold over the past several years (Lappé and Collins 2015). The government has recognized that “sustainable agriculture, in terms of food security, rural employment, and environmentally sustainable technologies such as soil conservation, sustainable natural resource management and biodiversity protection, are essential for holistic rural development” (National Portal of India 2016), and is now offering various programs designed to benefit farmers.

KERALA

Kerala has a total population of 33,406,061 (India Census 2011) and a geographic area of 3,900,000 hectares. Its population density is 2.5 times higher than the India national average. Forests cover twenty-eight percent of total land area and the state is also home to a number of lakes, backwaters, lagoons, and estuaries (Planning Commission 2008). Only ten percent of the land is used for non-agricultural purposes. Kerala boasts the highest human development index of any of the states in India and is often commended for its health care system, high literacy rates (in particular of women), and low fertility rates. This has been largely credited to the socialist policies led by its historic communist government; it was the first place in the world to democratically elect a communist government in 1957 (Mannathukkaren 2010, 296).

In 1969 major land reform in Kerala abolished absentee land ownership associated with high levels of exploitation and oppression, which led to over two million acres of land to be redistributed, laying the foundation for participatory democracy. While agricultural productivity decreased overall, general quality of life was greatly improved. Kerala took India's decentralization program in the 1990's to a whole new level when, in August of 1996, their left-coalition government decided to allocate 35-40 percent of its annual budget for new development plans to projects designed by the local bodies themselves (Verón 2001).

Since the 1970's, the state of Kerala has been esteemed as a model of development, deemed the "Kerala Model" (Verón 2001; Parayil 1996). The sustainable development techniques received some critique and were modified in the 1990's (Verón 2011). The Kerala economy has been described as a "democratic socialist welfare state" and although it has been said that its industrial sector is fairly weak, it boasts itself as the only Indian state to have banking facilities in every village (Times of India 2011). In 2008 the state already had 24 scheduled commercial banks, 495 branches of district cooperative banks, and 1,961 primary agricultural cooperatives, it is indeed a fairly well banked region. The Industrial sector primarily consists of cashew processing, handloom-weaving, rubber processing, tea and coffee processing, and handicrafts (Planning Commission 2008).

Even though the state is quite developed, vulnerable populations include scheduled caste and tribal populations, fishermen, and agricultural workers. More recently, the Kerala economy has entered into a period of decline and stagnation characterized by underemployment and low employment of youth in particular. It is one of the only states within India in which work participation has actually declined, particularly of women. According to the Kerala Development Report, work participation rates of women in Kerala are the lowest in India, particularly in rural re-

gions, and the occupational mobility is very low; females rarely hold decision making positions. Many argue that much of Kerala's wealth is actually derived from outside the state, mainly from the Arabian Peninsula, in the form of remittances which have helped to compensate for the lack of domestic production (Planning Commission 2008). There is a huge migration in particular of Kerala youth to the Gulf. The Kerala Gulf Diaspora is a term used to describe the 2.5 million or so Keralites, mainly Malayalis, living in the Persian Gulf (Kurien 2002; Walton-Roberts 2013). In 2012 the State was the highest recipient of remittances within India. In 2011, remittances to Kerala reached \$7.5 million USD (INR 49,965 crore), accounting for 31.2 percent of the states' GDP, according a Kerala Migration Survey, conducted by the Centre for Development Studies (CDS) (Jayanth 2012).

While literacy levels are high and education is accessible across genders, literacy of Scheduled Caste and Tribals remains lower than the general population. According to the 2008 Development Report, the two main vulnerable populations in the state are the Adivasis (tribal population) due to their alienation from tribal land, as well as fishermen and their families. Adivasis constitute only 14 percent of Kerala population with 37 percent living in the Wayanad, Palakkad, and Idukki districts, Wayanad accounting for 14 percent of total Kerala Adivasi population. Dowry-related issues are also of major concern for women and violence against women is on the rise (Miriam 2011; Planning Commission 2008). It also highlights that women's voices in Kerala are often not adequately heard and acted upon despite the decentralized planning (Planning Commission 2008). Unemployment among the educated population is a huge concern, particularly of women. Eighteen percent of educated men remain unemployed while 71 percent of educated females remain unemployed, and one half of educated unemployed in the state fall between the age of 15-29 years old (Planning Commission 2008).

In regard to the environment of Kerala, a large portion of the Western Ghats, a mountain range designated as a biodiversity “hotspot” by Conservation International, fall within the state. A “biodiversity hotspot”, according to Conservation International (2016), signifies is a biologically significant region under extreme ecological threat. In Kerala, these ecological hotspots are some of most highly populated biodiversity hotspots globally, mainly inhabited by tribal people (Voorhees 2010). While there are twenty national parks and sixty-eight sanctuaries within the state aimed to conserve precious wildlife areas such as the Wayanad Wildlife Sanctuary, only 15 percent of the Western Ghats are currently protected (Conservation International 2016). Verón argued in 2000 that Kerala was not facing a severe ecological crisis however he did note several emerging environmental problems that were becoming more apparent such as deforestation, ongoing paddy conversions, disruption of backwater ecosystems, the ‘chemicization’ of agriculture, pollution of water and soils, urbanization, and air pollution by growing vehicle travel. He also noted increasing consumerism in Kerala and rising imports from other states, boosted by the Gulf remittances, suggest that Kerala is increasingly externalizing environmentally unsound industrial production (605).

Kerala has made investments into renewable energy, boasting the first completely solar powered airport in the world in its commercial capital, Cochin (Menon 2015). However, the Kerala Development Report describes Kerala’s overall energy situation as slightly worrisome. Although it has vast hydropower resources, they are largely untapped, making Kerala a net importer of electricity. The State has recently turned to thermal energy, however they have been experiencing a high increase in demand for electricity due to improvements in the standard of living, which have caused power outages, and load-shedding. The report also notes that 40 percent

of households remain unelectrified despite many claims that all villages have been electrified (Planning Commission 2008).

Similarly many people are supposed to be receiving piped water; in reality, a large portion of people are dependent upon open wells, ponds, and natural streams for drinking water needs. The present water supply for piped water has been found to be inadequate to meet projected demand and the Kerala Water Authority has had many problems with material and financial management of their projects. Water illiteracy in the area is also high (Planning Commission 2008). Kerala has been experiencing water shortages, particularly in the summer months, and much of the groundwater in the region is of poor quality due to pollution from industrial and agricultural chemical effluents.

Within the agricultural sector in Kerala, there has been a movement away from labor intensive crops to commercial crops exposed to international markets. Since the beginning of the WTO, bilateral trade agreements have done damage to the Kerala economy, although they may have had a positive effect on the national economy overall, according to the state's development report in 2008. The report discusses the significant changes of various crop cultivations in which it notes the decrease in areas used for rice, tapioca, and cashew nut cultivation and a switch to crops such as coffee, coconut, rubber, pepper, and ginger. Price ratios have tended to work against the farmer, in particular for cultivators and food crops. The share of agriculture of the state GDP has declined from 56 percent in 1960 to 13 percent in 2003-2004. Declines in cultivation of local crops has been blamed in part to inadequate supply of irrigation water and utilization of irrigation (Planning Commission 2008). In response to growing concerns on the environment, in 2010, the state of Kerala declared the goal of becoming 100 percent organic within ten years and by 2013, fifteen thousand farmers were already in the process of securing organic certi-

fication (Lappé and Collins 2015), which equates to about 12 percent of the state's total agricultural cultivators, not including laborers, according to the 2011 Census (India Census 2011).

In regard to food security, Kerala relies on food importation to meet domestic needs. Food distribution has shifted in recent years from a majority reliance on the public distribution channels such as the governmental Civil Supplies Corporation to private traders, thus increasing the risk of food insecurity vulnerability to market conditions (Planning Commission 2008). The following statement from world hunger specialists further emphasizes this vulnerability, “if farmers are at the mercy of those who control distribution of farm inputs and marketing of farm commodities, they are powerless even if large operators do not monopolize the land” (Lappé and Collins 2015, 96).

Overall, Kerala upholds higher levels of equity and other human development achievements than the rest of the nation (Verón 2000; Jafar 2014). It's participatory planning process and land redistribution have been seen as quite noteworthy in promoting sustainable development initiatives (Jafar 2014), making Kerala a model for sustainable development (Verón 2000). Nonetheless, there are still numerous environmental, social, and economic challenges facing the region particularly for women, tribals, and small farmers (Planning Commission 2008; Scaria 2014; Miriam 2011).

WAYANAD

Wayanad is a northern district of Kerala that borders both the states of Tamil Nadu and Karnataka, as well as the Kerala districts of Kannur and Kozhikode (Calicut). It is comprised of twenty-five panchayat (“village councils”), that fall under four regional blocks: (1) Mananthavady (2) Kalpetta (3) Sulthanbathery, and (4) Panamaram as demonstrated by Figure 3. The towns of Kalpetta, Sulthan Bathery and Mananthavady are the three major business centers of the district with Kalpetta hosting the district government headquarters.

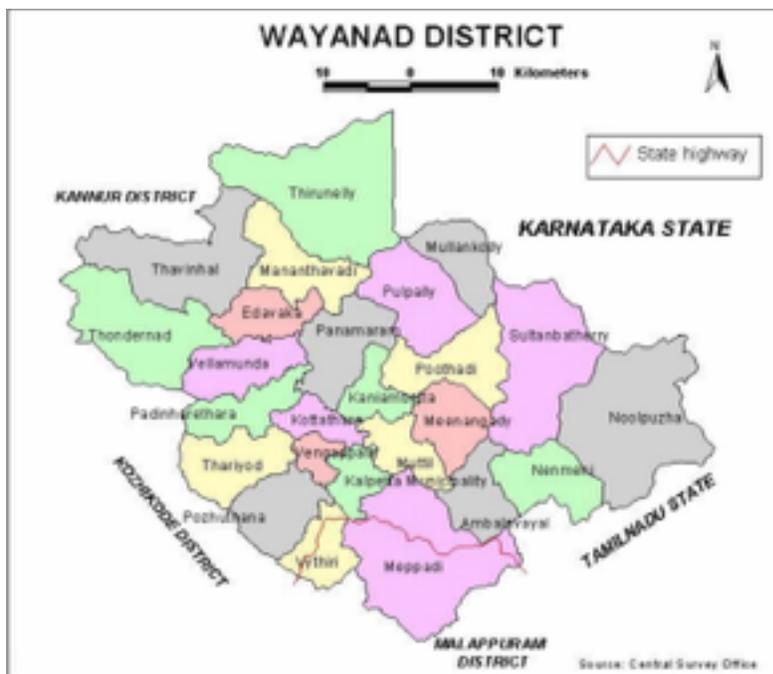


Figure 3: Wayanad district from Wayand district website²

Although, Wayanad is primarily an agricultural region; the name Wayanad actually derives from “vayal nadu”, which translates to land of rice paddy fields. The district is a large producer of cash crops such as pepper, cardamom, coffee, tea, and rubber (Wayanad District 2016; Münster 2012). According to the 2011 Census Data, approximately 817,420 people live in

²Wayanad District Website. Panchayat Election Results 2005. <http://wayanad.nic.in/election/home.htm>. Accessed May 1, 2016

Wayanad and 89 percent of the population are literate. However more recent literature suggest that the current literacy rate is 92.8 percent (Upendranadh 2008), which is much greater than the national average of 64 percent (India Census 2011). Around fifty percent of the population are Hindu, one quarter are of Christian faith, and the remaining quarter are Muslim, apart from a small Jain community (Wayand District 2016). Wayanad is home to twenty tribal (Adivasi) groups population, and is widely influenced by tribal culture (Betz et al. 2014; Wayanad District 2016). According to the 2011 Census, the total population of scheduled tribal people within the district is 151,443, comprising 18.5 percent of the total population. The majority of these tribal people consist of the Paniya Tribe (45 percent) followed by the Kurichyan (17) , Kuruman (14), and Kattunaykkan (11) , Adiya (7.3), Vettakuruma (4.23), and the remaining belonging to the Urali, Thachanadan mooppan, Wayanad Kadar, Mala Arayar, Ulladar, and Karimpalan tribes (NIC Wayanad 2015; Chandrika and Nandakumar 2009). These tribal groups can be broadly classified into farming communities, landless agricultural labourers, artisan communities, and hunter-gatherer communities (Betz et al. 2014). It is widely known that the Kurichyan and the Kuruman tribes are in a much better situation socio-economically than the other tribes (Betz et al. 2014), many of them owning land and running successful farms. Whereas other tribes, particularly the Paniya tribe are considered to be a “landless” group that typically work as agricultural day laborers. Seventy-two percent of all Paniya tribal people in India live within the Wayanad district (Ichikawa and Santhoshkumar 2011), Many tribal colonies within Wayanad, particularly the Kattunaykkan, are located within or on the fringe of forests which are considered to be a very valuable resource to tribals given they provide abode and source of living as well have deep and historical significance to tribal culture.

Some cite the large number of tribal people to be linked to the “backwardness” of Wayanad. The district has been a large recipient of India’s Backward Regions Grant Fund (BRGF) administered by the National Institute for Rural Development (NIRD). The goal of the BRGF is to “mitigate regional imbalances, contribute towards poverty alleviation in backward districts and promote accountable and responsible Panchayats and Municipalities” (NIRD 2016). The term “backward” in India signifies areas and people characterized by a lack of education, services and infrastructure, as well as poverty, exploitation of labour, and “untouchability”. Backward areas are economically weak due to limited job opportunities and low per capita income (NIRD 2016), and tend to be rural and agricultural in nature. Wayanad is entitled to ₹13.3 crore (\$133 million) through the BRGF however only 30 percent of this was utilized, and no new plan for Wayanad district has been developed by the NIRD (BRGF Report 2009). While Kerala is considered to be highly progressive, recording the highest rates of literacy, health access, and decentralized power, Wayanad falls behind in these metrics. Wayanad is considered to be the most backward region within Kerala, along with the Palakkad District (Nair 2006; Upendranadh 2008).

Wayanad is a region of significant ecological importance and often considered to be a “tropical paradise” for tourists drawn to its beautiful wildlife sanctuary and tribal influenced culture (Münster and Münster 2012; District of Wayanad 2016). According to estimates though, less than 10 percent of the pre-colonial forest cover (including private forest) of the region remains intact today (Münster 2012). Wayanad’s forests are fragmented, dispersed into scattered islands of forest bordering densely populated agrarian land (Conservation International 2016; Voorhees 2010; Munster 2012). The tensions related to land use, agriculture, wildlife conservation, and tribal displacement in Wayanad are well documented and discussed in the literature (Münster and

Münster 2012). Munster argues that Wayanad nature and culture are being commodified through “eco-tourism” and that the historical exploitation of Adivasi tribal people is not being addressed by municipal governments. He argues that the Wayanad Tourist Department by implementing their “responsible tourism” program is more likely to cause tourist “ethnic village zoos” rather than anything sustainable for the local population that is moving out of the farming industry towards an unpredictable tourist market. Currently the Indian Forest Service is moving agricultural activity out of these “priority ecological areas”, however it is debated whether the areas are being ecologically restored by doing so. Münster suggests that the banning of cattle to promote tourism while increasing the amount of human traffic within the area is rather a form of accumulation by dispossession (Munster and Munster 2012).

In Wayanad, 74 percent of the workforce is dependent upon agricultural based activities (Wayanad Initiative 2006) and 40 percent of the labor force is agricultural day laborers (Indian Census 2011). The district is the largest producer of goods for exports in the state of Kerala, mainly of plantation crops such as pepper, cardamom, coffee, tea, spices, and other condiments (The Official Web Portal 2016). In early 2000, farmers were experiencing levels of success by switching to cash cropping while Wayanad simultaneously drew in more “eco-tourism” (Munster 2012). However by 2004 the district of Wayanad was featured regionally as an area of Agrarian distress characterized by falling crop prices, an increased number of farmer suicides, and a site of increased environmental damage and synthetic fertilizer use (Munster 2012; George, Jose, and Krishnaprasad 2006).

One of the largest indicators of this agrarian distress within Wayanad was the high numbers of farmer suicides reported within the district from 2005-2009 specifically. Between 1997 and 2005, Kerala had 11,516 farmer suicides, of which 90 percent (10,364) occurred within the

district of Wayanad (Münster 2012; Badami 2014). There continue to be farmer suicides within the state, in the year 2014 alone Kerala reported 104 farmer suicides (National Crime Records Bureau 2015). Issues of landlessness, heavy or sole reliance on farm income, inability to access government assistance, natural disasters, heavy debt, in addition to malnutrition have been repeatedly cited as contributing factors leading to farmer suicide (Mishra 2007; Every Thirty Minutes 2011), a phenomenon that has not only affected Wayanad. Munster has attributed the shift from subsistence based farming to monoculture cash cropping in order to enter into the global market and the resulting vulnerability to global price drops as the largest contributor to farmer suicides within Wayanad specifically (Münster 2012). Partially as a result of this distress, it is estimated that there are approximately 14,000 widows within Wayanad who now find themselves in very culturally and economically vulnerable situations (Voorhees 2010). They are often forced to work as landless laborers and battle creditors. Widows in India are commonly discriminated against, and often held responsible for their husband's suicides (Voorhees 2010; The Hindu 2006; BBC 2014). Apart from the volatile position that farmers and their family's livelihoods are placed in, there are serious ecological imbalances and health risks that are imposed from monoculture cash cropping as it requires heavy use of fertilizer and pesticides. This has led to soil damage, water pollution, and a reliance on external inputs (Posani 2009).

The literature thus demonstrates that food and agriculture is a valuable entry point in addressing sustainable development and that India in particular is a region of concern when discussing food security and farmer vulnerability. While Kerala is seen as a model for sustainable development, there are still areas of concern, particularly related to the environment, that need to be addressed. Tribal communities, women, and farmers in Kerala and especially in Wayanad have been identified as facing extreme economic, environmental, and social challenges. The lit-

erature also demonstrates that there is demand for sustainable living opportunities aimed at improving the lives of locals, in particular geared towards tribal people, women, and agricultural workers. However the literature review also demonstrates a gap in knowledge, in particular related to the assets and capacity of the community to overcome some of the aforementioned challenges. There is also a lack of academic knowledge about the most current livelihood situation for farmers in Wayanad, as most of the literature dates back several years. There is little information that demonstrates the direct demands of the Wayanad agricultural community, and little research has directly focused on the needs of women agricultural workers in particular.

TGGFCT: ABOUT THE ORGANIZATION

The Golden Greens Foundation Charitable Trust (TGGFCT) is a non-profit public charitable trust, initiated by The Golden Greens, a sustainable rural development consulting group. The foundation aims to uplift the most vulnerable populations by equipping people in rural areas with skills, resources, and opportunities so that they may self-sustain. Their activities began in January 2012 however they have only formally been constituted as a public charitable trust since August 2014, and just recently received their 12A registration in India, which is similar in nature to 501(c) 3 status in the United States (About Us: Objectives 2015). This organization, based out of Wayanad district is dedicated to developing livable, healthy, and sustainable communities in *rural* areas through the empowerment of local people. Their passion for advancing human and societal development, particularly in rural areas of the third world, is exemplified by the words of their founder: “we cannot continue to exploit a population that feeds the world when they themselves do not have enough food to eat” (About Us: Letter from the Chairman 2015). The foundation currently manages the Green Gardens Farm overseeing 100 percent organic pepper, car-

damom, tea and coffee plantations, a goat farm, a nursery, chicken coop, compost pit, and a handmade tea processing unit. They have also recently opened two skill development centers to provide tailoring, stitching and embroidery trainings to local women. They believe, as guided by a large portion of the development literature, that investing in women is one of the best ways to invest into a community (Laiju 2016).

Through their operations they are able to provide “sustainable livelihood” and international volunteering opportunities related to organic farming, livestock management, and skill training by providing employment for 7-8 full time employees and 7-8 seasonal employees. Prior to my visit, they were interested in expanding their programing to serve the needs of the most vulnerable sections of society and had identified some of the following objectives to help guide their activities, however no systematic community analysis or needs-assessment was performed in identifying these objectives (TGGFCT 2015), which have since then been modified:

1. To develop livelihood projects in the agricultural/farming sector
2. Empowerment of women and youth in rural areas through co-op farming missions and skill development
3. Educational sponsorship for less fortunate children in rural areas
4. Medical and legal support to those in rural areas.

Therefore I conducted a needs based evaluation for the organization in order to assess the current challenges, assets, and gaps in services within the Wayanad community. The organization was primarily interested in determining the most vulnerable communities for whom they should target as the future potential beneficiaries of their programs and initiatives. This thesis will explore the needs assessment I conducted in order to provide recommendations for the organization and community at large.

METHODOLOGY

EVALUATING SUSTAINABLE LIVELIHOODS: AN OVERVIEW

The decision to focus on a needs based evaluation stems from the 5 Tiered Approach to Evaluation as described by Jacobs and Kapusik, emphasized by Tier One. The 5 Tiered Approach defines Tier One, Needs Assessment, as a system to collect and analyze information on the “nature, size, and distribution of a particular problem, the resources and capacities of communities and individuals, and possible ways to solve problems” (Jacobs and Kapusik 2000, 148). However, a common critique of needs assessments is that they focus too much attention on the negative (deficits) of a community rather than the positive assets within them. This has led to a hybrid model of community assessment that incorporates asset/capacity building (Altschuld, Hsing-Lee, and Lee 2014). It is now widely believed that when “communities note their strengths and what they bring to the table, they can be enabled to move forward in many situations” (Altschuld, Hsing-Lee, and Lee 2014, 90). Asset/Capacity Building thus lays the foundation for improvement by identifying resources, social structures, people, and existing programs within a community that can become the basis for change. Altschuld, Hsing-Lee, and Lee (2014) argue that a hybrid needs and asset/capacity building framework should incorporate empowerment evaluation, strengths, weaknesses, opportunities and threats (SWOT) components, as well as address strategic planning.

While measuring and evaluating human conditions and progress is not a new concept, the methods and techniques to do so have greatly adapted over the years (Lindenberg 2002). There are many organizations that are involved with human progress measurements including the United States Agency for International Development (USAID), United Nations Development Pro-

gram (UNDP), the World Bank, the Food and Agriculture Organization (FAO), CARE, and the Department for International Development (DFID). Marc Lindenberg provides us with an overview of the transformation of progress measurement from concerns solely related to economic progress to a combination of economic and social progress parameters. He notes that this led to new approaches, such as the Human Development Index (HDI), which has been widely adopted by many organizations (Lindenberg 2002). The evaluation tool that I developed pulls from both the literature regarding household livelihood security indexes as well as sustainable livelihood security indexes.

Lindenberg describes the household livelihood security approach as a participatory community assessment technique to measure progress at the family and community level. He describes that this technique helps to identify “the constraints to people’s wellbeing as well as their assets and opportunities”, which can be used in order to design effective programs to overcome these barriers (Lindenberg 2002, 302). The Household Livelihood Security (HLS) framework can be traced back to Bechel and Sewell in the 1950’s and was officially adopted by CARE, an international relief and development non-profit, in 1994 as the primary framework for its programming and evaluations (Frankenberger, Drinkwater, and Maxwell 2000). Household Livelihood Security is defined as “adequate and sustainable access to income and resources to meet basic needs (including adequate access to food, potable water, health facilities, educational opportunities, housing, and time for community participation and social integration)” (Frankenberger, Drinkwater, and Maxwell 2000, 3). The household livelihood security index consists of eight components: income/assets, food and nutrition, education, participation, water, sanitation, primary health, and reproductive health. These components are grouped into 5 areas: economic security, food security, health security, educational security, and empowerment.

The Sustainable Livelihood Security Index (SLSI) is another index that promotes some of the same values as the HDL however does not focus on the household level. The SLSI was proposed in 1991 by Swaminathan as a “tool to evaluate the potential of Sustainable Development (Biswas and Suresh Kumar 2014). Sustainable livelihood security (SLS) has been defined as “livelihood options that are ecologically secure, economically efficient and socially equitable” (Biswas and Suresh Kumar 2014, 332). In one particular evaluation some sustainable livelihood security indicators included: forest cover, degraded area, groundwater development stress (ecological); land productivity, labor productivity, per capita income (economic); female literacy, infant mortality, food grain availability (social) (Biswas and Suresh Kumar 2014).

MY METHODS

In order to better understand the current situation related to sustainable livelihoods in Wayanad, I carried out an assessment of the needs, wants, and assets in relation to social, economic, and environmental conditions that exist for the rural community near the Green Gardens Farm in the district of Wayanad, Kerala in Southern India. This method was chosen in an effort to combine parameters of demands, and asset/capacity building assessments; as well as household and sustainable livelihood security frameworks. In building my assessment tool, I combined strategies to help create a hybrid framework that could create a platform for the community to self-identify their needs and demands, as well as highlight and identify the existing assets that already exist within the community. I also designed my research methodology in order to provide the TGG Foundation Charitable Trust (TGGFCT) with recommendations to develop their programs and understand the needs of their future potential beneficiaries. This assessment aimed to understand community-identified challenges, identify current assets and capacity within the

community, as well as document unmet needs. Another purpose of the study was to understand the extent to which community members are involved in the planning and development of sustainable living through empowerment projects in this particular community.

My guiding research questions entering into the project were:

- What are the greatest issues related to sustainable livelihoods facing the community near The Green Gardens Farm in Wayanad? (What are the needs and demands related to environmental, social, and economic indicators as determined by the community?)
- What relevant programs or assets already exist within the community?
- What are the gaps in services available?
- What programs should be developed by TGGFCT to improve the livelihoods of people in this region?

I conducted my research through a community-level assessment of needs, demands, and assets, using available data, performing an environmental scan, and conducting interviews with key community and local organization leaders, as well as focus groups with potential beneficiaries of the organization. I utilized various strategies in order to understand the issues of concern for the community both from an organizational standpoint as well as on a household level. The aim was to understand community identified issues and assets both from an institutional perspective as well as on an individual and household level. All field research was limited to the geographic area of Wayanad, Kerala.

Developing the Instruments

First, I identified the following populations from whom I wanted to collect data: (1) Agricultural Workers, (2) Paniya Tribals, (3) and women to understand the challenges of vulnerable populations within the community and lastly (4) community leaders to hear from local ex-

perts working at the ground level to address sustainability challenges. I then developed an assortment of instruments (surveys, focus group guides, and interview questions) in order to collect information from these varying population groups. In developing and editing the instruments, I reviewed several sustainable livelihood framework evaluations (Biswas and Suresh Kumar 2014; Reddy 2010), one of which was a CARE baseline survey that was conducted in India. This particular evaluation measured socio-economic standards of living, livelihood opportunities, vocational skills, water access, hygiene and sanitation awareness, literacy levels, environmental awareness and available infrastructure, and proved to be a valuable resource in developing my own survey questions (Reddy 2010). Empowerment and dignity concepts were integral in developing the tools. Inspired by a previous UEP master's thesis (Guanzon 2007), I used three constructs to classify my questions and findings: Environmental, Economic, and Social, which are often referred to as the "Triple Bottom Line" or the "Three Pillars of Sustainability" (United Nations 1987). Figure 4 helps to demonstrate how I developed the concepts and data that I explored in the research analysis using the triple bottom line framework.

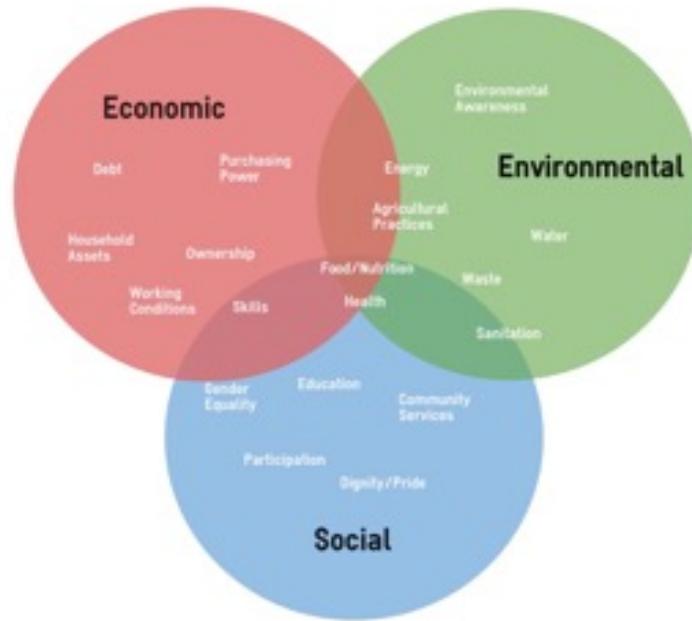


Figure 4: Assessment triple bottom line framework

I made a purposeful effort to speak to members of the agricultural community, with a particular emphasis on women and tribals. The decision to do this stemmed from feminist principles of evaluation which value “plac[ing] central importance on the lives and experiences of marginalized groups” (Cassaro and Hood 2002, 33). The instruments were pilot tested twice, once before arriving to Wayanad with a colleague familiar with both India and economic development. After the first pilot test, instruments were translated to Malayalam by a native Keralite and Tufts University student. Once arriving to Wayanad, a 30 year old male translator from Wayanad with a master’s degree in business was hired; he joined for all field research in order to ensure the proper translations of all surveys, interviews, and focus groups. The second pilot test was done with this translator, to ensure that the translations that were done from English to Malayalam made sense within the local context in both English and Malayalam.

Table 1 demonstrates the research methods that were used for the varying groups of participants and the name of the instrument I developed that was used for each population:

Population Groups	Interviews	Surveys	Focus Groups	Name of Instrument Used*
Farmers and Agricultural Laborers	x	x	x	Agricultural Worker Instrument
Paniya Tribals	x	x		Agricultural Worker Instrument
Women	x	x	x	Agricultural Worker Instrument
Community Leaders	x			Community Leader Instrument

Table 1: Research methods and instruments used for varying populations

**To view the instruments and evaluation strategies used, see Appendix A-C.*

Now I will explain the specific methodologies used for each of these population groups.

Agricultural Community

In order to understand the needs of local farmers, I spoke with agricultural landowners and day laborers. Interviews and focus groups were done with a translator present using the Agricultural Worker Instrument, which contains both survey and interview questions. All re-

sponses were translated directly by the translator on the spot and surveys were done one on one with each individual question being translated one at a time while I took notes.

- Focus Group with 10 male agricultural landowners all located within 1km of the TGGFCT Onneyar office location taking place on February 10, 2016.
- 6 individual interviews (3 of whom were fully surveyed) with mostly male farm landowners within 1km of TGGFCT Onneyar office location that took place between February 10-15, 2016. Three of the six interviews and two of the three surveys were conducted with participants from the aforementioned focus group.
- 5 surveys of agricultural day laborers (4 female, 1 male) that work on the Green Gardens Farm operated by TGGFCT near Annapara which took place on February 13th, 2016.

Women

To better understand the concerns for women in Wayanad I conducted two focus group conversations with two Women Self Help Groups. Most of the women who were involved with these self help focus groups worked as agricultural day laborers and thus were also insightful for understanding the needs of agricultural workers.

- Focus Group with 13 women involved with a Self Help Group located near TGGFCT Onneyar office location on February 9, 2016.
- Focus Group of 7 women involved with a Self Help Group near the Green Gardens Farm on February 14, 2016.

To better understand the role and needs of women in Wayanad society, a special attempt was taken to speak to women in the absence of men to ensure a safe space for them to voice any of their concerns.

Paniya Tribals

I surveyed and interviewed eight tribals of Paniya origin; six of the Paniya tribals interviewed were female and two male. Two of the interviewees, a husband and wife, are of the same household and therefore their answers were quite similar. An effort was made to focus solely on Paniya tribals given their large representation within Wayanad. Paniya tribals interviewed tended to work as agricultural laborers and were therefore also insightful in understanding the needs of the agricultural community. All tribals interviewed lived within a 2km radius of TGGFCT office location in Onneyar, Wayanad. The surveying was conducted over two days during the week of February 8th, 2016. Similar to the Agricultural Workers, interviews and focus groups were done with a translator present using the Agricultural Worker Instrument. All responses were translated directly by the translator on the spot and surveys were done one on one with each individual question being translated one at a time while I took notes.

Community/Organization Leaders

In order to hear directly from “local experts” I investigated existing non-profit organizations in Wayanad addressing sustainable livelihood concerns. In order to identify these organizations, I searched the internet for non-profit organizations doing work related to the environment, agriculture, women empowerment, and social services within Wayanad. Between February 8th-15th, 2016, I visited seven organizations and conducted interviews with representatives, of-

ten the director, of the organizations I had pre-identified before my arrival. Below you will find information regarding each organization as well as the representative from the organization with whom I spoke. Organization representatives were interviewed in person in English.

Organic Wayanad

<http://www.vanamoolika.org/organicWayanad.php>

K M George, Program Coordinator

An organization dedicated to socio-economic development of small and marginal farmer communities of Wayanad. Organic Wayanad is also located in the same location and is considered to be very connected to *Vanamoolika Herbals* (<http://www.vanamoolika.org/>). Vanamoolika is a non-profit that provides 375 local women the facilities to run a factory which produces around 180 organic food products, nutraceuticals, and ayurvedic medicinal and cosmetic products.

Ms. Swaminathan Research Foundation Community Agrobiodiversity Centre (MSSRF)

<https://www.mssrfcabc.res.in/>

Dr. Anil Kumar, Director

Aims to address pertinent issues of sustainable agriculture and rural development through agrobiodiversity.

Shreyas Social Service Centre

P.B. Sasikumar, Project Officer

The official social development organization of the Malankara Catholic Diocese of Bathery to uplift the poor and marginalized, which started in 1979 and has been registered since 1986. It works for the development of Marginal Farmers, Tribals, Women, Children and Senior Citizens.

Wayanad Social Service Society (WSSS)

<http://www.wsssindia.com/>

Rev. Father Bijo Karukapallil, Director & Jose, Program Coordinator

WSSS aims to promote socio-economic empowerment targeted towards tribals, women, small and marginal farmers through participatory development interventions.

Ashkeya Center

Anice Indikuzha, Director

An organization dedicated to social and environmental services including watershed development, farmer support, and women's welfare.

Regional Agricultural Research Station (RARS)

Dr. Rajendran, Director & Rajees P.C. , Teaching Assistant (Agronomy)

<http://www.kau.in/institution/regional-agricultural-research-station-ambalavayal>

Research Station responsible for the generation and transfer of technology related to rice and rice based cropping systems, pulses, vegetables, organic farming and seed technology.

Krishi Vigyan Kendra (KVK)

Professor P.K. Abdul Jabbar

KVK is based out of the same location as the Regional Agricultural Research Station (RARS). KVK conducts training programmes, frontline demonstrations, and participatory action research programmes. Professor Jabbar, who was interviewed, is also the founder of “[Sunday Farming](#)”, a group that shares innovative and low cost farming technologies with first-time farmers, providing a platform to grow their own food.

Figure 5 demonstrates the locations of my research fieldwork within Wayanad. The two research zones where I conducted interviews, focus groups, and surveys include the 1.5 kilometer radius surrounding the two locations of TGGFCT. The more southern research zone surrounds their office location and the northern research zone encompasses the location of their farm, the Green Gardens. The locations marked by red stars indicate the location of the seven organizations with whom I conducted interviews.



Figure 5: Wayanad Research Assessment Locations

This thesis will be a presentation of the results from the interviews, focus groups, and surveys. I will first discuss some of the summary results from the surveys, focus groups, and interviews and then analyze the challenges, assets, and gaps in services that I found through my research process. In the end, I will make recommendations both local organizations and government to consider pursuing in ensuring sustainable livelihoods in this area.

RESULTS

CURRENT HOUSEHOLD LEVEL CONDITIONS

Survey Results

As discussed in the Methodology section, I chose to explore various environmental, social, and economic concepts through the survey questions that I developed in the agricultural worker instrument in order to better understand the state of livelihood securities at the household level within Wayanad. You can refer to Figure 2 to get a better understanding of the organization of the concepts I aimed to explore. Below I will provide summary results of the sixteen surveys that were conducted with the eight Paniya tribals, five agricultural workers, and three farm landowners. I will also touch upon findings from the three focus groups that were conducted with male farm landowners and the two female self help groups.

Environmental

Through conducting surveys at a household level I was able to understand some of the environmental situations related to agricultural practices, environmental awareness, energy, waste, water, sanitation, and food/nutrition.

Agricultural Practices

I found that most farmers were interested in or had a desire to convert to 100% organic practices. All but two farmers who participated in the research study claimed that they wanted to become completely organic. The two that did not express this interest were convinced that it was economically infeasible, but were aware of the health risks associated with synthetic pesticides and fertilizers. I did find that many farmers were aware of bio fertilizers however most farmers were still using synthetic pesticides not considered to be acceptable. Many did indicate that they had reduced the amount of synthetic fertilizers they were using in an attempt to move towards more organic practices and ensure the sustainability of their soils, and also because the prices of conventional pesticides and fertilizers had increased. I also documented some of the common pesticides and fertilizers which are being used in the region which can be found in the Environmental Challenges section of this paper.

Environmental Awareness

All farm landowners interviewed were at least somewhat concerned with pollution in their communities, two of the five agricultural laborers interviewed were somewhat concerned with pollution, however only one of the eight tribals that was interviewed indicated any concern or knowledge of pollution and environmental concern in their community.

Energy

I did find that most homes in Wayanad are connected to an electricity source. While most people surveyed had some complaints regarding low voltage or daily power outages, in general they had access to electricity most if not all of the day. However three of the eight tribals indicated not having any electricity connection in their home.

Waste

The most common forms of waste disposal methods were to bury household waste in a pit, burn it, compost it, or create biogas from it. Although, one tribal member surveyed indicated that the government came to collect the waste near his settlement. While most interviewees indicated that they generated very little waste, the most common practice for waste above others was burning.

Water

Everyone I surveyed had access to a drinking water source, most of the farm landowners had piped water connected to their houses, whereas many tribals had access to panchayat government wells. 56 percent of respondents used a well for their water purposes, while the remaining 47 percent had piped water pumped to their house using a motor, all boiling their water for drinking purposes. While one agricultural worker noted it took her 30 minutes to get water and bring it back to her home, on average the total time it took for survey respondents to collect their water and bring it home, if they had a well, was 12.5 minutes. Only one of the eight agricultural workers and farmers surveyed did not have direct piped water to their home, whereas none of the tribals I spoke to did. All tribals had access to a government (panchayat installed) well, an example of one can be found in Figure 6 below.



Figure 6: Panchayat installed well of a tribal community that was surveyed

Sanitation

The majority (81%) of the 16 people I surveyed had sanitation facilities, with 68 percent having their own personal non-shared toilet facility, most commonly a traditional squat toilet in their own home. However, I found that two tribal households were sharing facilities with 5-8 other people. Whereas 100 percent of agricultural laborers and farm landowners had a non-shared facility, 62.5 percent of tribals either had shared facilities and 3 of the 8 tribals not having any sanitation facilities at all. This analysis demonstrates that there is a discrepancy between tribal households and non tribals.

Food/Nutrition

I did not find that food security seemed to be an issue of major concern in the area, with 43 percent of survey participants claiming they were very satisfied with their food needs and the remaining 67 percent claiming that they were satisfied— even if they had claimed that they were

unsatisfied with their current economic conditions. Most respondents shopped both at a local market, typically in Ambalavayal, and supplemented their food needs with items from their own kitchen gardens. One farm landowner did however mention he was concerned about the chemicals that were in his food due to pesticides and fertilizers. This demonstrates that the community has access to their food needs.

Social

While conducting surveys and focus groups in the community, the social indicators that I aimed to better understand included dignity, health, nutrition, participation, education, and community services. I will explain the household findings related to each concept below.

Dignity

While several respondents noted that they had not felt such a moment of “dignity” in their life for quite some time, others were joyful to share their moments of pride. The aspects that gave interviewees the greatest sense of dignity in their life had been helping others through charitable activities, educational achievements and awards, as well as family relations. One woman also specifically mentioned that which gave her the most sense of pride in her life was that her husband wasn’t an alcoholic. Another farmer said his greatest sense of pride was when he was recognized with the “Best Farmer in Amabalavayal” award several years before, as well as his time spent serving in the local panchayat council.

Health

Surveyed participants indicated that some of the most common diseases affecting locals included sickle cell anemia and cancer, however no one I spoke to was suffering from either of these conditions. One tribal woman surveyed had palsy, while another had an underdeveloped fetus of one of the twins she was carrying. While no one surveyed mentioned inadequate health

care access or service as an issue of concern, three tribals mentioned their health condition as a debilitating factor in their life. One tribal was in a wheelchair due to an accident he had incurred while working as an arecanut tree climber. While arecanut climbers are compensated more highly for their work (1,000rupees/day) than the typical male day laborer salary (500rupees), lacking insurance, they are not compensated for any injury they incur. Another agricultural worker had incurred huge amounts of debt in order to pay for her husband's health care fees for his heart and kidney conditions.

Education

There is a wide variety of schooling options available within the community, both public and private. It appeared that the older generation were more likely to have dropped out of school early, however their children experienced higher levels of educational success. None of the research participants mentioned dissatisfaction with the school system in Wayanad. Of the tribals that were surveyed, three women indicated that they had not received any formal education, one of whom was around 70 years old and the other two in their mid 30's. The remaining seven tribals' level of educational achievement ranged from completing 2nd-10th standard (equivalent to 2nd-10th grade in the United States Educational System). Among the agricultural day laborers surveyed, one woman had completed schooling up to 12th standard, another two women had completed up to 10th, and the last two had only reached 3rd and 4th standard, the man receiving the least amount of education. Of the farm landowners I surveyed, all three had completed their public education up to 12th standard and had even attended university afterward. This demonstrates that there is a discrepancy in educational achievement between groups, with landowners having the highest levels of educational achievement, followed by day laborers, and tribals with the lowest.

Participation

Two of the surveyed participants indicated that they were involved in the government in some way; one had served on the panchayat planning board, another worked in the government tax department as his primary job apart from farming. Most of the women who were surveyed were involved in a Self Help Group (SHG), many specifically mentioning involvement in a Kudumbhasaree SHG³. The female agricultural worker with the highest level of educational achievement noted her involvement in the Jalanidhi water project, as well as a government training she had done in 2002 to learn how to collect data for the Census. Most of the tribals indicated that they were familiar with or had received some services from the government, most notably access to drinking water wells.

Gender Equality

While only one female agricultural worker explicitly mentioned wanting men and women's wages to be equalized, survey responses indicated that there was a major discrepancy between female and male wages as shown in Table 2. I found that female day laborers make on average 48% less money than male, which I will discuss further in the economic challenges section of this paper.

	Average daily wage including those that do not work (Rs/day)	Average daily wage of only those that work (Rs/day)
Women	206	258
Men	401	500

³ Kudumbhasaree is Kerala government initiated poverty eradication program that began in 1998 (Jafar, 2014)

% Difference in wage of females compared to males	-(48.8)	-(48.4)
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Table 2: Wayanad day laborer average wage by gender

I also found that it was more common for men to be the owners of land property. One of the more interesting things to note related to gender inequality however is the discrepancy between males and females in relation to paid and unpaid work as demonstrated in Table 3 below. Of the 6 females surveyed who worked, they averaged working 43 hours per week, whereas the 5 males that worked averaged 47 hours per week. However in regards to unpaid work, the 10 females who participated in the survey averaged working 19 hours per week unpaid whereas men only averaged 6 hours of unpaid work per week. While all of the women indicated working at home unpaid at least 7 hours per week, four of the male participants indicated that they did no unpaid work. This confirms what one Keralite academic described women’s working status imposing a “double role’, one as the homemaker and another as the ‘earner’” (Scaria, 2014).

	Average hours/week of paid work*	Average hours/week of unpaid work**
Women	43.4	19
Men	47.1	6.3

Table 3: Average hours/week of paid and unpaid work by gender

*Calculated only for participants who indicated that they did work

**Calculated for all participants

Positively, I did find that it was common for both husband and wife to share the role of

making household decisions and purchases together, although many households still indicated that the male had the final say.

Economic

Also through surveys and interviews I explored the following economic concepts: purchasing power, ownership, debt, household assets, working conditions, and skills.

Purchasing Power

Using incomes reported by both surveyed tribals and their household members, as well as data collected by landowners on the wages they pay their employees, I was able to calculate an average income for both male and female agricultural workers. The average income for day laborers was 500 rupees/day for men and 258 rupees/day for women, which signifies that women that work on average make 48% less than men that work. Nearly everyone that was spoken to indicated that they were not able to save much money throughout the year apart from two agricultural landowners, who indicated that they are able to save up to 250,000 rupees/year. In addition, one tribal member indicated that their household was able to save 5,000 rupees/year. Overall, there was a significant discrepancy in wealth and assets between agricultural landowners and tribals and day laborers. Two of the three landowners were making 4,000-11,000 rupees/week. Whereas, most day laborers reported making 1,250-3,500 rupees/week, depending on if they were male or female. In conceptualizing these incomes into purchasing power, I have listed some of the prices of common goods in the region in Table 4 below. Women in a focus group indicated that they felt that a woman needs a monthly salary of 10,000 rupees in order to maintain their households and buy any necessary goods for herself, however most of them only made 6,400 rupees/month at best during the peak season (January-March).

Item (quantity)	Price (Rs)
------------------------	-------------------

Onion (1kg)	20
Tomatoes (1kg)	20
Rice (1kg)	38
Coconut Oil (1L)	140
Dry Fish (250g)	60
Milk (1kg)	60
Electricity (1 month for 2 bedroom house)	250
Autorickshaw (5km trip)	55
Local Bus (5km trip)	7

Table 4: Prices of some common items in Wayanad region according to interviews

Ownership

In terms of ownership, everyone surveyed or interviewed owned their house, except one tribal household whose house was owned by a family member indicating a 93 percent ownership rate. Everyone I spoke to demonstrated that their land or house was in the name of a male apart from two female agricultural workers indicating that their land and house were in their own name.

Skills

One farmer surveyed had previously received an agricultural vocational degree from RARS, however no one else had received any formal agricultural training. When asked what skills they might be interested in on a survey, most respondents replied that they had little to no interest to seek additional skills, particularly if they were older in age. One farmer did indicate

that he would be interested in receiving trainings on plantation management, and plant diseases. Another tribal man indicated that he was very interested in receiving various types of training however he was unable to take the time off of work in order to do so because his wife isn't working. He noted that she also can't read or write so she doesn't feel confident doing a training herself.

Working Conditions

60 percent of those surveyed indicated that they were happy or very happy with their working conditions, whereas 40 percent indicated that they were somewhat happy with their working conditions. In some instances this meant that they were somewhat happy or happy with being unemployed.

Household Assets

Some indicators of household wealth and assets were livestock and poultry, a refrigerator, gas stove, car or motorbike, and particularly gold or silver. I also found that electricity access was an indicator of wealth, whereas most agricultural workers and farm landowners had consistent electricity in their homes, three of the eight tribal houses did not have electricity in their homes at all. In general, while everyone reported having some household assets, tribal households tended to have fewer assets than the non-tribals with whom I spoke to.

Debt

It appeared that nearly everyone surveyed had access to a formal bank, and therefore access to credit and loans. The average loan amount among the 16 respondents was approximately 99,000 rupees (\$1500 USD). For farm landowners, I found that most had some form of loan or debt, ranging from 25,000 rupees to 450,000 rupees. Among the tribals surveyed, 6 of the 8 had some form of a loan, which ranged from 2,000-10,000 rupees. The most common source of loans

in the region was both from state and commercial banks, local cooperatives (with 0-4% interest rates), SHGs for women, as well as the Grameen Bank; apart from one tribal who indicated he had a 25% interest rate from a moneylender, demonstrating the need for increased financial counseling.

Summary

Of the participants of the survey, 62.5 percent were female, and 50 percent were tribal. Overall, by analyzing household level data for the 16 individuals (8 tribals, 5 agricultural workers, and 3 farm land owners), I found that tribals in general had less access to water, sanitation, and energy than the agricultural workers and farmers. Not to mention, they noted lower levels of educational achievement, and moments of dignity and participation. I concluded that there is a socioeconomic stratification among the individuals I surveyed in which farm landowners have more assets, followed by agricultural workers, and then tribals. It should be noted that none of the farm landowners were female. In order to demonstrate this stratification, I will refer to tribals, agricultural workers, and farm landowners as separate in the analysis of Wayanad's community challenges in the Challenges section.

Focus Groups

I held a focus group with 10 male farm landowners in Onneyar which proved to be helpful in understanding some of the current agricultural practices. Table 5 presents information on the land area and the types of crops grown by the 10 agricultural landowners that participated in the survey. As demonstrated by the table, their farmland area ranged between a half acre to eight acres and the most common crops grown by the group were arecanut (100%), coffee (90%), pepper (90%), and coconut (70%).

Land Area (acre)	Pepper	Arecanut	Coffee	Coconut	Tea	Banana/Plantain	Rubber	Cardamom	Ginger	Nutmeg	Rice
0.5	x	x	x								
5.5	x	x	x		x	x	x				x
8		x	x	x	x		x	x		x	
4	x	x		x	x		x				
3	x	x	x	x						x	
1	x	x	x	x							
2	x	x	x			x	x				
1	x	x	x	x		x			x		
0.7	x	x	x	x							
5	x	x	x	x							

Table 5: Farmer focus group land size and crop information

I also hosted two focus groups with two separate female self help groups. One was conducted with a group of women, mainly agricultural workers who live near the Green Gardens farm that TGGFCT operates, in which 7 of the 10 women involved with a Kumbasaree Self Help Group (SHG) ranging from age 30-70 participated. The second was one conducted close to TGGFCT office location in which 13 women of an 18 person SHG were present. It was apparent that issues highlighted by women were very different than the main concerns addressed by the male farm landowners. Women of the second help group identified that they would be interested in value-added processing of some of the goods they produce in their home gardens, such as

green tea, jackfruit, yams, as well as curry powders. They also noted that they wanted better wages, indicating they feel they need 10,000 rupees/month in order to run a household.

Farmer Interviews

I was also able to interview three additional farmers in the area who had been recommended to me by members of KVK and RARS as successful farmers in the region, two of whom were incorporating aquaculture into their farming practices and another who was producing 100 percent organic produce for a niche market based out of Calicut called Jeva Veg. The owner of Syam Farms (see Appendix E), maintains a biodiversity forest farm that integrates aquaculture with traditional cultivations such as arecanut, pepper, and coffee as well as conserving rare species through his medicinal plant nursery. These proved helpful in understanding more about the agricultural practices and assets within the district.

INSTITUTIONAL LEVEL DATA

Organizational Responses

After interviewing seven organizational leaders, I found that there are a plethora of programs and support groups aimed to improve sustainable livelihood conditions within Wayanad. According to interviews with organizational leaders, there are at least 100,000 community members (delineated below) that are involved with at least one of the seven organizations I spoke with, which equates to approximately 12% of the total population of Wayanad.

- **Organic Wayanad:** works with 300 farmers throughout the district.

- **Vanamoolika:** Has a staff of 375 women.

- **WSSS:** provides direct employment to 200 people and works directly with 375 families and 1,000 women self help groups. Through its 25 programs they estimated that their efforts have impacted around 50,000 people.
- **MSSRF:** 450 person staff, offers training, and partners with SHGs
- **Shreyas:** Works with 43,000 people through 3,413 groups
- **RARS:** 800 direct employment + 250 SHGs
- **KVK:** Has offered trainings to 5,000+ people
- **Aksheya:** 3 employees + 350 SHGs

It should be noted that all organizational leaders were male, apart from the Director of the Aksheya Center, which demonstrates a lack of female participation in management positions within the community. I also found that most of the non-profits with whom I spoke to received a majority of their funding from the government itself. Several mentioned they used to depend more upon international donations, however since the introduction of Modi as Prime Minister and a Greenpeace incident⁴, the context and policies of non-profits has drastically changed. Modi is increasing oversight of NGO's by investigating their annual tax returns and restricting foreign funds (Ahuja and Baruch, 2015). However, there was no doubt that the partnership between the non-profits I spoke to and local government agencies was extremely strong, in many cases the non-profit was receiving funding from the government to carry out a project such as Shreyas' involvement with the Jananidhi water project.

⁴ Modi's crackdown on NGO's has been greatly connected to his criticism of Greenpeace and other NGO's for hindering India's development and growth rate through their campaigns particularly against nuclear and coal (Ahuja and Baruch, 2015, Rowlatt, 2015)

ANALYSIS

In order to analyze the data I collected, in particular from the focus groups and interviews with organizational leaders and farmers, I will organize my results into the following sections, again using the Triple Bottom Line framework for each section:

- (1) Challenges
- (2) Assets
- (3) Gaps in Services

I will pull from data that I found from focus groups, surveys, and interviews to further explore and expand upon the community identified challenges, assets, and gaps in services.

CHALLENGES

In order to understand the environmental, social and economic conditions of Wayanad on a more institutional level, I interviewed community experts from seven organizations, about the various challenges affecting the Wayanad community. After reviewing their responses I was able to analyze environmental, social, and economic challenges occurring in Wayanad by grouping the frequency of concerns that I heard from each community leader into categories of inter-related concepts. I was also able to confirm some of the challenges by comparing to household level data collected through surveys and focus groups.

Environmental

I categorized the environmental concerns of Wayanad that emerged from interviews into the following concepts: (1) Climate Change, (2) Land Changes, (3) Ecosystem Imbalances (4) Use of Pesticides and Fertilizers, (5) Decreased Soil Quality, (6) Loss of Biodiversity, (7) Water

and Irrigation Issues, (8) Waste Management. It should be noted that the delineation of these categories does not suggest that the causes or solutions to these challenges are isolated from one another, but is simply a tool to analyze and understand them.

Table 6 contains the organizational responses to the aforementioned categories of environmental challenges. I consider an organization to be concerned with the category if they explicitly mentioned an issue related to the category during their interview. As demonstrated by the table, every organization mentioned synthetic fertilizer and pesticide use as a major environmental concern and all but one organization explicitly mentioned climate change or climatic shifts as a major environmental challenge. Whereas, Table 7 demonstrates which research population groups analyzed at a household level indicated concern with the same challenge categories.

	Cli- mate Chang e	Land Use Chang e	Ecosystem Imbal- ances	Synthetic Pesticide & Fertilizer Use	Loss of Biodiversi- ty	Water	Waste
Organic Wayanad	x	x	x	x	x	x	
WSSS		x*		x	x		x
MSSRF	x			x	x	x	
Shreyas	x			x		x	x
RARS	x	x	x	x		x	
KVK	x	x*	x	x			
Aksheya		x		x		x	x

Table 6: Environmental challenges organizational analysis

*Specifically mentioned the quarry industry as a major contributor to land change within Wayanad.

	Climate Change	Land Use Change	Ecosystem Imbalances	Synthetic Pesticide & Fertilizer Use	Loss of Biodiversity	Water	Waste
Women Focus Group 1			x			x	
Women Focus Group 2							x
Farmer Focus Group	x	x	x	x	x	x	
Tribals						x	x
Agricultural Workers	x			x		x	
Farm Landowners	x	x		x		x	

Table 7: Environmental challenges household analysis

Considering the responses from the Wayanad community, it can be argued that the areas of most pressing environmental concerns facing Wayanad are synthetic and pesticide use, climate change, water concerns, as well as deforestation and land change. Areas of additional concern

include waste management, the loss of biodiversity (specifically of medicinal plant varieties), as well as ecosystem imbalances.

I will elaborate on each of the specific environmental challenge in Wayanad, as explained to me by the organizations in the community, as well as by including some of the household data I found through surveys, interviews, and focus groups with women, agricultural workers, and tribals.

Climate Change

Nearly all of the organizations and farmers that I spoke to mentioned that Wayanad was experiencing climatic shifts that were drastically affecting agricultural yields, profits, and crop selections. One issue is that the region has experienced a noticeable increase in temperature. According to PB Rajees, Assistant Professor of Agronomy at the Regional Agricultural Research Station in Ambalavayal, the minimum temperature in Wayanad used to drop down to as low as 7-8 degrees Celsius. In the current year however the lowest temperature reported was 12 degrees Celsius. These changes are occurring at the other extreme as well. Peak temperatures in Wayanad are expected in the months of March, at around 31.5-32 degrees Celsius. On the day I interviewed him, in mid-February, the temperature was 34 degrees Celsius, two degrees above the maximum temperature Wayanad was accustomed to reaching a month later. Many noted that previously in Wayanad it was impossible to cultivate rubber which requires high temperatures, whereas now many farmers are switching from tea and rice cultivation to rubber. This troubled one farmer who specified that rubber plantations require clear cutting areas for monocropping and thus are not very environmentally friendly.

Rainfall patterns have also transformed over the past few years. Farmers indicated that prior to the last several years, rain typically came at a consistent rate over the monsoon period

between June-September, the first rain occurring in March, with an annual average rainfall of nearly 300 millimeters. Over the past several years, according to community members, the first rain has been coming much later in the year. For the past two years it didn't come until after June 15th. While Wayanad is still receiving the same amount of rainfall on average during the monsoon, they are experiencing what used to be a month of rain in two to three days. This change in rainfall timing and distribution has led to several major concerns related to local crop varieties. For both coffee and pepper, a delay of the first rain leads to much lower production yields. Rain acts as the pollinating agent for pepper and is essential for coffee plants to flower, an important step in order for the plant to produce coffee beans. While I was doing research most farms in the area with coffee were not experiencing flowering yet, however one farmer I surveyed had set up an irrigation system to ensure his coffee plants received rainfall at the appropriate time and thus a financially successful season for the upcoming year which is demonstrated by Figure 7. One farmer in an interview specifically noted, "If climate change continues how it has, within ten years pepper will be gone". For rice, early rains are necessary for the success of the crop and any rain after the harvest is detrimental to the crop. For the past several years the delayed rains have caused damage to the rice crops.



Figure 7: A photo of flowering robusta coffee plants at a farm in Wayanad

It was mentioned in several interviews as well as the farmer focus group that rice cultivation is hardly practiced at all in Wayanad now due to the changing climate. This is ironic given the district's name derives from "vayal nadu" which means paddy (rice) field. In a focus group with local farmers, they stated that half of the paddy fields in the local vicinity had been converted to other cultivations due to changing weather patterns. Not to mention, rice is not an economically feasible crop for farmers anymore given the amount of hard labor required for its production and the low price it currently fetches in the market, despite its continued use as a staple food in the area.

All crops, not just those mentioned, are affected by these climate changes. The inhabitants of Wayanad have been noticing the impact of climate change increasingly over the past ten years, and need additional support to handle its effects.

Land Changes

Wayanad is experiencing a variety of land changes including changing crop patterns, a significant shift towards monocropping, deforestation, land fragmentation, and mining, which are all drastically changing the landscape of the district. Deforestation was mentioned by five local organizational leaders in the area as an issue of concern. Several also mentioned that the designated “protected” forest areas have been experiencing significant changes over the years as they become less “wild” and more “cultivated”. Previously forested areas were in greater quantity, primarily inhabited by tribals, and reflected more of the natural landscape of the region. Currently, most tribals are relocated to the edges of the forest or to entirely new areas, while many of the forested areas have been fragmented and are used for eucalyptus, acacia, and teak cultivation, eco-tourism projects. These areas are experiencing a significant loss of biodiversity as well as changes in soil and water composition. Two organizations specifically mentioned the quarry industry as a contributing agent to the loss of forested area as well as an issue of increasing environmental concern in their interviews. According to an interview with RARS, over 50 quarries have been constructed in Wayanad over the last 10 years alone, currently in operation for granite mining. There have even been several instances of unlicensed quarrying within the area (The Hindu, 2010). One community leader specifically mentioned the complete destruction of Manna-para Hill due to the quarrying industry; an image of the quarrying industries effect on the landscape is demonstrated in Figure 8.



Figure 8: View from Edakkal Caves of the quarry located at Phantom Rock

On the other side, the quarrying industry is regarded as an important contributor to the economic development of the region, further complicating the issue. As previously discussed in the literature, Wayanad is experiencing tension related to wildlife, land use, and forested areas that needs to be addressed.

Ecosystem Imbalances

Changing climate and land patterns have led to several ecosystem imbalances in the Wayanad region. The combination of deforestation with a lack of fruiting trees and water in forested areas has slowly pushed wildlife out of “forest” areas and into human settlements. This has led to an increase in wildlife attacks within Wayanad, which has created a lot of political unrest within the region (The Hindu, 2015). There are numerous cases of elephant, tiger, and wild boar attacks within the region which have affected the sense of security among locals. According

to one interviewee, these wildlife conflicts have also caused severe crop damage in the area (Anand, 2016).

This is just one manifestation of the ecosystem imbalances that Wayanad is experiencing. Professor Jabbar of KVK pointed out that some of the food chain systems within the area are also impacted, affecting wildlife and crops. For example, after pesticides began to be used more commonly in the area to protect against crabs, the resulting loss of crabs then led to a decrease in the number of foxes in the region. Reduced fox populations in turn led to an increase in wild boars. Climatic changes and degraded soils have also led to increasingly prevalent plant diseases and pests. Quick Wilt and Slow Wilt are the diseases most commonly reported by farmers to be affecting their pepper cultivations. Figure 9 displays the fatal effects of slow wilt disease on a pepper vine of a Wayanad farm demonstrated by the brown and dry pepper plant leaves. The increased temperature particularly pushes farmers to abandon and convert their tea plantations to other ventures such as coffee and rubber plantations due to the increase in cases of disease.



Figure 9: Slow wilt disease on pepper vine of Wayanad farm

Use of Pesticides & Fertilizers



Figure 10: Monsanto RoundUp pesticide used by local farmer



Figure 11: Common fertilizer used by local farmers

Every organizational leader that was interviewed mentioned the use of synthetic pesticides and fertilizers as an environmental problem within the Wayanad area. It appeared that the local community was aware of the connection between toxic chemicals and increased human health impacts such as cancer. Several farmers even noted that they have separate banana and vegetable gardens for their household consumption, in which they do not use these conventional agricultural chemicals because they themselves do not want to consume these toxic chemicals. According to RARS, the most common synthetic pesticides used in the Region are Rogor, Ekanux, and Confidur for insect infestations, and Isaborostene and Mangled Suff for fungal infections. Whereas common fertilizers used in the region include chemical urea, rock phosphate, and potash. Nearly everyone that brought up synthetic fertilizer and pesticide use, mentioned the continued use of Furadan (Carbonfuran) as an issue of major concern. Furadan is a synthetic pesticide that is still commonly sprayed on banana plantations. Interviewees attributed its continued use, despite its official ban in the state of Kerala in 2011, to Wayanad's proximity to the states of Tamil Nadu and Karnataka. The lack of monitoring at state border check-points allows farmers to continue to buy "red listed" synthetic pesticides and fertilizers

and use them for their plantations (Devasia T.K., 2011, Matthew, 2011, Manoj E.M., 2015).

When speaking directly to farmers, I found that some of the pesticides and fertilizers that they used included Monsanto's RoundUp, Indian Potash, and copper oxychloride.

Synthetic pesticide and fertilizer use is highly related to soil quality. While Wayanad is typically known for its high quality loamy soils with organic matter ranging from 1-2.5%, several interviewees asserted that the soil quality of Wayanad has been degrading over the years, noting the decrease in organic matter and microbes. According to those interviewed at RARS, the most common soil challenges in the area include acidic soil (low pH) as well as various nutrient deficiencies. Nutrient deficiencies include Magnesium, Calcium, Potassium, and Boron. There are various strategies to handle the soil issues of the region, however, most farmers are opting for synthetic fertilizers for their soil quality needs, such as Borax for Boron. I was able to document the most common practices being used against common nutrient deficiencies in the area, according to an interviewee from RARS demonstrated in Table 8 below.

Farmers involved in the focus group specifically mentioned that their soil was very loose eight to ten years ago, and that more recently it has been hardening. They also stated that they are starting to switch away from synthetic fertilizers because they felt it was damaging their soil over time. When speaking to RARS, they noted that the reasons for these soil changes is not confirmed but that many speculate it is related to increased synthetic chemical usage. Several organizations, namely Organic Wayanad and WSSS promoted 100% organic practices, whereas KVK and RARS supported integrated agricultural techniques which incorporate the minimal use of synthetic pesticides and fertilizers.

However both organizational leaders and farmers alike agreed that it was problematic that synthetic fertilizers are cheaper and more readily available in the region. According to an in-

interviewee, synthetic fertilizers can be bought for 20 ₹/kg, whereas biofertilizers cost between 75-105 ₹/kg. Farmers also displayed a distrust of biofertilizers currently being sold. One interviewee noted that the biofertilizers being sold actually have synthetics in them and participants of the farmer focus group complained that some of the biofertilizers they had purchased at discounted rates from the government had passed their expiration date by the time it reached them, making them completely ineffective.

Synthetic fertilizer and pesticide use was the environmental issue that was most commonly identified by research participants. Not to mention, farmers in Wayanad face a myriad of issues related to soil quality within the region that is of increasing concern. It is likely that increased chemical application is linked to the decreasing soil quality. While farmers are interested in pursuing alternative methods to transition away from toxic applications, they currently lack the knowledge and resources to convert to alternative methods.

<i>Organic</i>	<i>Synthetic</i>
<i>Cow dung</i> <i>Compost</i> <i>Rhizobium (N)</i> <i>Vesicular arbuscular mycorrhizae (VAM)</i> <i>Biopotash (K)</i> <i>Azotobacter (N)</i> <i>Fish (B)</i> <i>Jeera Madharah (B)</i> <i>Dolomite Lime (Mg, Ca)</i>	<i>Urea (N)</i> <i>Rock Phosphate (P)</i> <i>Potash or Potash/Sulfate (K)</i> <i>Borax (B)</i>

Table 8: How to treat nutrient deficiencies in Wayanad⁵

⁵ Source: Interview with Rajees P.C. (RARS)

Loss of Biodiversity

As mentioned before, climatic shifts are drastically affecting the types of crops that are able to flourish within Wayanad, such as rice. This is quite alarming especially for organizations such as MSSRF who are concerned with preserving and promoting the unique varieties of plant and animal species within Wayanad. Currently there are twenty eight rice varieties being cultivated in Wayanad, however their future potential for cultivation is diminishing. On top of the environmental barriers, market prices for certain varieties of crops are more favorable than others. These prices push farmers to prioritize cultivating varieties of rice that yield a higher profit, thus reducing the overall biodiversity of the region. This shift towards monocropping doesn't only relate to rice; it is a problem with other plants and crops including bananas, coffee, yams, and more, as noted by Dr. Anil Kumar of MSSRF. This means that certain varieties, which have been noted for containing specific medicinal properties, are at risk for becoming endangered because they are not commonly cultivated.

One of the greatest concerns related to biodiversity conservation within the region is the loss of medicinal plant varieties of the region. Wayanad is home to over 600 medicinal plant varieties (Balakrishnan et al., 2011), which have only recently been documented by MSSRF. Many of the plant varieties and their benefits are not well known and, therefore, often clear cut when preparing land areas for agricultural purposes. The reduction of these plants could be a huge loss for the medical and nutraceutical field.

Water

Community members spoke of several water challenges that are present within Wayanad. Water is typically prevalent within the Wayanad region, a benefit of the rain intensive monsoon season. However in recent years, some areas within the region have had groundwater depletion issues in early summer months before the Monsoon season begins. The Shreyas annual report specifically mentioned water shortages as an area of concern. The months with the greatest risk are April and May. As mentioned previously, the shift in rain patterns greatly impacts crop production. This will need to be monitored in the future especially as more residents gain access to water through increased well to house water piping and thereby potentially increasing the quantity of water removed from the watershed.

The water-related issue that community members mentioned the most was the lack of irrigation infrastructure within the district, in particular for farmers. Farmers noted that their only source of water is rain, and thus with an increasingly unpredictable and transforming climate, they are at the mercy of the weather. This in more recent years has led to increasingly lower crop yields, particularly of tea and pepper. The second water-related concern is access to water, toilets and sanitation in some of the poor and tribal areas of the region, according to a survey with WSSS. The area of Wayanad considered to be the most distressed in relation to water is Poothandy, with many shortages, low accessibility, and poor sanitation, according to Shreyas' annual report. With increased infrastructure farmers could have confidence in their crop production however this could result in a risk for personal water accessibility for households in the region.

Waste Management

There is currently no public infrastructure or system for managing waste in Wayanad, apart from the Ambalavayal Grama Panchayat Waste Disposal Plant. This government funded

facility, which was constructed in late 2014, is located on what was formerly used as a dumping site for the community. The small facility currently operates every day from 9am-6pm processing 500-600 tons of waste per day, primarily waste generated by local businesses in the downtown area of Ambalavayal. The plant is designed to burn all trash material apart from glass and aluminum (including plastics, food waste, batteries, paper, and more) through an incinerator, as displayed in Figure 12. The incinerator combines with steam to dilute the smoke and air contamination, resulting in an ash byproduct, which is left on site. There is very little community awareness and use of the facility; while it has the technological capacity to process double the quantity of trash they do currently, their three employees would expect additional compensation and support to do this. Little is known about the composition of the ash byproduct or its toxicity levels, which the facility's workers are commonly exposed to, often using it to plant food that they eat from the onsite garden.

Several organization members identified a lack of waste management as a challenge yet to be addressed within the community. Most who discussed the topic noted it as an area in which they were not working on, apart from Shreyas who has recently constructed several biogas plants in the area, which are using anaerobic digestion to create fuel from organic waste. In talking with local community members and farmers, the most common mechanism to deal with household trash was to dig a pit and burn it. While most households do not produce too much solid waste (0.2-3kg/day) and typically compost their organic waste, the burning of plastic is still an area of concern. There is no recycling infrastructure in the region.



Figure 10: Ambalavyal Waste Treatment Plant

Social

While nearly all of the organizations that I interviewed are associated with environmental issues in some way, they are not all focused on addressing the social concerns facing Wayanad. The three organizations that offer social services are WSSS, Shreyas, and Aksheya; it may be noted that all three of these organizations also have a religious affiliation. I will draw from interviews, focus groups, and survey data to draw conclusions related to this section. I categorized the social problems concerning Wayanad into the following categories: (1) Alcohol Abuse, (2)

Women's Issues, (3) Healthcare, (4) Tribal Issues, (5) Education, and (6) Infrastructure in Table 9 and 10 below.

	Substance Abuse	Women's Issues	Health	Education & Skills	Infrastructure
Organic Wayanad		x	x		
WSSS	x	x	x	x	x
MSSRF		x		x	
Shreyas	x	x		x	
RARS			x		
KVK				x	
Aksheya	x	x	x	x	

Table 9: Social challenges organizational analysis

	Substance Abuse	Women's Issues	Health	Education & Skills	Infrastructure
Women Focus Group 1		x	x	x	
Women Focus Group 2	x	x	x		x
Farmer Focus Group			x	x	x
Tribals	x	x	x	x	
Agricultural Workers		x	x		

Farm Landowners			x	x	x
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Table 10: Social challenges household analysis

Substance Abuse

When discussing social concerns in Wayanad, alcoholism and alcohol abuse is one of the first problems mentioned. It is a problem that has even prompted policy changes at the state and district level for Kerala and Wayanad. In 2014, Kerala banned the sale and consumption of alcohol in bars within the state, reduced the number of alcoholic beverages that can be purchased at a given time, and reduced the total permissible quantity of alcohol one can have in their possession at a given time. Wayanad only has two locations that permit the sale of alcohol, which are often home to a long queue of Indian men, particularly after wage day. Substance abuse and the subsequent domestic fights were identified as the main problems affecting society by a focus group of seven women in the area near Ambalavayal and Annapara.

Women's Issues

The second social challenge that many organizations mentioned were challenges faced by women in particular. The main concerns affecting women that were identified are the lack of access to employment opportunities and therefore little financial control over their own livelihood, domestic abuse and violence - in particular if their husband has a drinking problem - as well as daily challenges related to their domestic role. These include water and cooking fuel accessibility issues as well as undervalued labor. Two of the six Paniya tribal women that I interviewed specif-

ically mentioned domestic abuse by their husband as a major challenge to their happiness, and this issue was brought up again by a focus group conducted with a women's SHG in the area.

While I explore gender inequality and the "pay gap" further in the Economic Challenges Section, I found that women who worked for some of the organizations I spoke to made 200-250 rupees/day whereas their male counterpart made 400 rupees. While many of the organizations recognize the disadvantaged situation of women in Indian society, they haven't addressed the issue internally. While nearly all of the organizations aim to empower women through their programs, there is still much more that needs to be done in order to improve the economic and social mobility of women in the region.

Health

Another issue of concern for the Wayanad community is related to health. While there are over 12 clinics and hospitals in the Wayanad region that offer healthcare services, Wayanad does not have its own public medical college to offer low cost emergency health care services. Therefore, it takes up to 4 hours to get to nearest public medical college (located in Calicut) and many people have died because of this long distance (WSSS Interview). Health concerns include cancer, alcohol and substance abuse, as well as sickle cell anemia, which mainly affects the tribal populations. According to interviews, the primary disease affecting the community is cancer. Cancer in the region has been linked to increased pesticide and chemical use (Krishnakumar and Sanandakumar, 2015), which has raised local concern with regards to the food that is being consumed in the region. It turns out that most of the fruits and vegetables being consumed in Wayanad, and Kerala are actually imported from Tamil Nadu and Karnataka. According to interviews, nearly all the produce found at local markets in Wayanad comes from Gundalpet in Karnataka, an area known to use synthetic fertilizers and pesticides. This clearly demonstrates that

despite Wayanad being a primarily agricultural community, there is a lack of food production aimed to meet the local demand and instead a push towards cash crops for export. The health issues faced in the region are indicative of how entwined environmental and social issues are in India, and possibly indicate that simple changes or improvements could have huge impacts.

Education & Skill Development

A lack of satisfaction with educational achievement seemed to be greatest in the tribal community. None of the tribals that were surveyed had completed their schooling until 12th standard. One tribal specifically noted that while he had a desire to pursue technical trainings and skill development he couldn't afford to take the time off in order to do it. He highlighted that his wife, who can't read or write, didn't have the confidence to pursue skill development because of this.

Infrastructure

The last category of social issues is related to infrastructure. One organization in particular noted the lack of quality roads and the need for better transportation access within the region. This is in alignment with findings from one study which found that 50 percent of villages in Wayanad are still without all-weather road connectivity, which becomes increasingly difficult during monsoon season (Upendranadh, 2008). According to interviews, other infrastructure that could be considered apart from better roads and increased public transportation services include waste management facilities, irrigation, and better healthcare access which were already touched upon in the Environment Section.

Economic

I categorized the economic concerns facing Wayanad into the following categories based on interview, focus group, and survey responses: (1) Debt/Loans, (2) Agrarian Distress, (3) Un-

employment, and (4) Gender Inequality. Table 11 and 12 demonstrate the categorical concern in relation to the organization or population group that voiced concern about the given issue.

Among organizational leaders, the issue of the greatest concern was identified as Agrarian Distress, or rather economic challenges faced by farmers. Six of the seven organization interviewees specifically mentioned economic challenges such as price fluctuations or market accessibility.

	Market Conditions	Debt/Loans	Unemployment	Gender Inequality
Organic Wayanad	x			x
WSSS	x	x		x
MSSRF	x			x
Shreyas	x	x		x
RARS	x			
KVK	x	x		
Aksheya	x	x		x

Table 11: Economic challenges organizational analysis

	Market Conditions	Debt/Loans	Unemployment	Gender Inequality
Women Focus Group 1	x	x		

Women Focus Group 2		x	x	
Farmer Focus Group	x			
Tribals		x	x	
Agricultural Workers		x		x
Farm Landowners	x	x		

Table 12: Economic challenges household analysis

Market Conditions

Market conditions was the most commonly identified economic challenge mentioned by the varying community members I spoke to. Given that the economy is primarily dependent upon agriculture, it is of utmost importance to understand some of the economic challenges that farmers are currently facing. According to interviews the most distressing factor for farmers is the persistent price fluctuations of cash crops such as tea, pepper, coffee, and ginger which make annual budgeting quite difficult for farmers. Prices have fluctuated dramatically, for example tea once dropped down to a low of 3 rupees per kg, which is less than the price many farms pay workers for picking tea (4rupees/kg). These price fluctuations are demonstrated by Table 13, which documents the reported price of local crops by farmers from 1-5 years ago as compared to their current price in the market (in February, 2016). While some goods have increased in price,

operating costs have increased while yields have dropped. For example one farmer noted that his pepper plantation used to produce 200-500kg/acre depending on the peak year of growth and now he's only getting 100kg/acre. The second cause of agrarian distress which farmers specifically complained about is the intermediaries and traders that control the prices they get for their goods. One farmer specifically stated that "farmers need to have more control over the prices of their goods".

The next major concern that farmers face is the lack of available labor for agriculture and the increasing labor prices. Labor prices, which have nearly tripled over the past 10 years, have made it so that farmers return to investment is very low. Farmers also noted that government programs such as the Mahatma Gandhi National Rural Employment Guarantee Scheme (NREGS) have created jobs that pay more for less labor intensive work, and thus undermine many farmers as employers. According to farmers in the focus group, people are now unwilling to do the hard labor necessary for agriculture at the prices that farmers can afford.

Farmers also mentioned that they were affected by multinational corporations such as DuPont, Syngenta, and Monsanto. After becoming dependent on their goods, farmers noted that the prices of fertilizers and pesticides began to increase, and that the corporations were driven by profit over the welfare of farmers. This has shifted several farmers to look into more organic practices. Nine of the ten farmers that participated in a focus group indicated that they had a desire to switch to completely organic practices, however indicated that there are many financial barriers that prevent them from doing so. In addition to the hardships farmers face to maintain their normal production, transitioning to organic practices requires a drop in production yield for at least two years, which would have significant economic repercussions for a small scale farmer. Farmers are unfortunately the ones that have to pay the price for this transition, despite its long

term benefits for human health and the soil. While already suffering from economic hardship, it is hard to imagine that farmers would choose to switch to organic practices without incentives, even if it could greatly improve the health of the District.

Crop	Current Price (Rs/kg)	Historical Price (Rs/kg)
Tea	18	12 (At one point it dropped as low as 3)
Rubber	240	80
Pepper	100-200	550*
Coffee	27	56
Arecanut	270**	180
Coconut	35**	20
Ginger	2800**	1600

Table 13: Current and historic prices of local crops according to farmers interviewed

*While pepper prices have increased over the years, yields have significantly lowered.

**Price of good in the year 2015 compared to 2016

Debt & Loans

Given the economic challenges that the largest economic sector within the district (agriculture) faces, it is not surprising that debt is a serious issue within the region. Debt was an issue raised by numerous organizations. Farmers in particular have been noted as a population of risk, particularly after the large quantity of farmer suicides that took place in the mid 2000's. With various factors creating a strenuous economic environment in Wayanad, people are looking for ways to make up the difference. However, with increased access to banks and loans, more people within Wayanad are at risk of going into debt. According to survey results, 60 percent of sur-

veyed participants had some form of debt or loan; the average amount of debt for the fifteen people surveyed was Rs. 100,000, with an average interest rate of 8 percent. It appeared that agricultural landowners had much higher amounts of debt (Rs.350,000 on average), one having as much as Rs.750,000 of debt. There was a large variation in the source of loans that research participants had from co-operatives to state banks, as well as their interest rates, which ranged from 0-25 percent. This demonstrates that there is financial capacity within the region to serve the needs of the community but also a demand for programs aimed at increasing financial literacy to mitigate the risks of taking a loan.

Gender Inequality

My analysis also demonstrated that there is a significant wage gap between women and men in the region. While no organization specifically mentioned the “pay gap”, survey responses indicated that female day laborers make on average 48% less money than their male counterpart, which I discussed earlier (See Table 2). This is fairly consistent with a study that found, on average, women in Kerala made 44% less than men from the period 2006-2013 (Varkkey and Cord, 2013). It’s therefore suiting that increasing employment opportunities and “women empowerment” to address gender inequality seemed to be an interest of nearly all community members that were involved with this research.

Unemployment

Unemployment was also mentioned as an issue of great societal concern in a focus group with 7 women. This is in alignment with my survey results, in which I found that 20% of survey participants and their family members were unemployed. It should also be noted that tribals

mentioned unemployment as an issue primarily caused by some of their lack of education in order to be able to get a job.

ASSETS

While it may appear that Wayanad is an area burdened by agrarian distress and various societal and environmental challenges, I have found that it is, in fact, an incredibly beautiful and resourceful community. Through fieldwork and research, I encountered a considerable number of community assets including non-profit programs, government services, local jobs, and community based organizations that aim to uphold the richness of Wayanad and promote sustainable living. I will begin to describe in more detail some of the community assets within Wayanad related to Sustainable Livelihoods, again using the triple bottom line framework. I will explain some of the services that are offered by the organizations with whom I interviewed during my fieldwork as well as additional community services that I identified through further research. Readers may also refer to *Appendix D: Wayanad Community Asset Map* and *Appendix E: Organization Resource Guide*, which were developed as a tool to visually demonstrate the asset section of my findings.

When research participants were asked what some of the greatest assets of the Wayanad region were, common responses included the beautiful landscape and climate of the region, tourism, human resources, and involvement with community based organizations such as Self Help Groups. After speaking to organizational leaders about the services they offer and members of the community about available services, I have grouped the community assets as explained to me or documented online into the following categories: (1) Conservation, (2) Infrastructure (3) Skill Trainings, (4) Community Services, (5) Health Care Facilities (6) Increasing Market Ac-

cess, and (7) Other Economic Assets which are organized in order of Environmental, Social, and Economic significance.

Environmental

Conservation

MSSRF, Organic Wayanad, Shreyas, and WSSS are all actively working on ensuring that some of the rare species unique to Wayanad do not go extinct. For example Organic Wayanad, helps to conserve 700 species at risk of being extinct by encouraging farmers to plant them and creating a market for them to sell through Vanamoolika, their partner organization which processes and produces 100% organic ayurvedic medicines. By creating products from these plants to sell, they can incentivize farmers to grow them by offering them a fair price for their cultivation. MSSRF, WSSS, and Syam Farms all have conservation gardens, which feature a variety of plants in particular of medicinal plant varieties. MSSRF has twenty acres of land that is designated as a Conservation Garden and works to promote both the genetic and cultural identity of the region, often working very closely with tribal communities in the region. They recently won the Plant Genome Savior Award by the Protection of Plant Varieties and Farmers' Rights Authority (PPV&FRA) of Government of India in 2008 for their work with the Wayanad Tribal Development Association, which provided them with funding to continue some of their projects. WSSS's Medicinal Conservation Garden & Botanical Museum is located in Boystown and is home to over 400 species. Shreyas also worked to promote medicinal plant conservation by distributing over 100,000 medicinal plants into the region. An interviewee at RARS boasted that 90% of all Wayanad plantations originated from their station, proving that they are also a major asset to Wayanad plant and agricultural life. RARS also hosts the annual Poopali Flower Show each year,

which aims to educate the public about the various varieties of yams, ginger, rice, ginger, and more.

Wayanad is also home to the second largest wildlife sanctuary in Kerala, consisting of both the Muthanga and Tholpetty Forests. Organizations such as MSSRF, and their partnerships with international stakeholders such as UNESCO and Conservation International, have been integral in ensuring that this region upholds its rich biodiversity. One interviewee highlighted that eco-tourism has and will likely continue to play a crucial role in providing economic benefits for the region's rich cultural and environmental biodiversity.

Infrastructure

Waste

As already discussed in the Challenges section, Wayanad does have one Waste Treatment Center which is currently processing the waste for the town of Ambalavayal. However, it does not have the capacity to serve the entire community. While organizations such as Shreyas are promoting the use of compost units and vermi-compost tanks, much less is being done in regards to plastic waste. There are increased sanitation and waste campaigns that are slowly trickling down through Self Help Groups, according to one of the women focus groups conducted. Another strategy that is being used for both waste reduction and energy production is the promotion of biogas plants, which use anaerobic digestion to create fuel from organic waste. This is just one example of the existing technologies that address multiple concerns through one mechanism that could be further implemented in the district.

Energy

Most houses have electricity connection, often powered by generators and powered through the Kerala State Electricity Board (KSEB) from hydro electric power stations. In regards to mitigating climate change and energy use, several organizations are promoting the use of renewable energy (Shreyas, WSSS) and two have even installed biogas plants in the region. Another strategy that is used to promote better air quality and health conditions is the promotion of “smokeless choolas” (see figure 13 below) which reduce the amount of smoke exposure to the person cooking, most commonly a woman.



Figure 11: Smokeless choola used at TGGFCT farm

Water

The Jalanidhi government project to ensure pure and safe drinking water to all citizens is managed by Shreyas. This is done through groundwater recharging, remote and mobile control mechanisms for automatic pump operations, chlorine disinfection using zinc aluminum tanks, as well as well pumping schemes. According to Shreyas annual report their Jalanidhi projects brought pure drinking water facilities to 1,488 marginalized families in 2015 (Shreyas, 2015).

The Aksheya Center is also involved in a watershed development program in which they help to maintain the watershed through rainwater harvesting, dam monitoring, and the construction of walls to protect streambanks during the rainy season.

There are several reservoirs and dams within the region, including the Banasura Sagar Dam Reservoir as well as the Karapuzha Reservoir. There is also Hridaya Saras, also known as “Heart Lake”.

Social

Transportation

There are various bus systems that service the Wayanad region, connecting it to local towns, cities, and major metropolitan areas such as Bangalore, Calicut, Kannur, Kochi, and more. The Kerala State Road Transportation Corporation is the entity that provides the most bus services within the Wayanad region by road. There are also private bus companies such as Red Bus, etc. Autorickshaws help to bridge the gap between spaces serviced by buses and residential areas. From the NW side of the district to the SE side is approximately a 2.5 hour car ride. From North to South the district is about a 2 hour journey by car.

Skill Trainings

There are various organizations that are dedicated to providing skill training and development for women specifically such as Shreyas, WSSS, and Aksheya. Both RARS and Organic Wayanad feature a collection of value-added products processed and produced by their female only staff and partners, which provide a revenue generating source to the women.

Organizations such as KVK, RARS, and Organic Wayanad are providing technical trainings particularly related to farming and agriculture. KVK is working on the ground with farmers to ensure safe and best practices of fertilizer and pesticides by connecting and sharing informa-

tion with farmers. Their knowledge and work with local farmers is an extremely valuable asset in ensuring the harmony of the local landscape.

Community Services

Community Based Organizations & Self Help Groups (SHGs)

There are a very large number of Self Help Groups within the region. Most women spoken to were involved in a Self Help Group and every organization indicated that they partner with various self help groups, even providing employment opportunities through the sale of value added goods (Organic Wayanad, WSSS, RARS). For example one woman interviewed was involved with a Shreyas water development project in which she was compensated for some of the time she spent as a secretary and money collector for the project.

There are several organizations that promote the formation of Self Help Groups and partner with varying SHGs and Community Based Organizations (CBOs). There tend to be more women led SHGs which allow for women to form a credit loan system within a group of friends.

Counseling/Family Services

There are several organizations that provide counseling of two varieties: (1) Economic/Financial (WSSS, Shreyas), and (2) Personal/Familial (Shreyas, Aksheya). In regards to substance abuse there are several resources available within the community. Shreyas and Aksheya both offer counseling services for families, WSSS also has a family development program which indirectly addresses some of these issues. There is also a de-addiction center located in Wayanad that offers services related to drug and alcohol addiction.

Tribal Services

Three organizations that I spoke to provide support to tribals and partner with tribal self-help groups (WSSS, Shreyas, and MSSRF). Tribals have access to various government programs

and services, for example there are several tribal only hospitals within the region. The Panchayat government has attempted to supply nearly all of their communities with a well for water, is currently devising several land distribution schemes to benefit tribals, as well as creating employment opportunities geared directly towards tribals. Nearly all of the organizations I spoke to however recognized that tribals provide a rich cultural history as well as valuable knowledge of indigenous plants and their medicinal properties which are valuable community assets. All the tribals I spoke to in surveys indicated that they experienced little to no problems in society identifying as a tribal.

Health Care Facilities

There are over 12 hospitals and clinics within the Wayanad region, one is run by the government and the rest are mainly private. There are also many ayurvedic facilities within the region providing care. According to one interviewee, Wayanad is also home to traditional medicinal treatment options that have been passed down by tribals which are unique to the region. For example, there is a tribal clinic dedicated to healing those with sprains and broken bones near Sulthan Bathery.

Economic

Increasing Market Access

Value-Added Processing

One way organizations are increasing farmers access to the market is by providing value-added processing of local agricultural goods such as jackfruit jams, ayurvedic medicines, and more. The organizations leading the way in these initiatives are Organic Wayanad/Vanamoolika, RARS, and WSSS. Organic Wayanad and WSSS are also providing opportunities to sell organic

and fair trade goods into international export markets by creating a strong brand for farmers within Wayanad so that they may fetch a better price than the local markets.

Poopali (RARS)

Poopali is the annual flower show hosted by the Regional Agriculture Research Station (RARS) aimed to share the latest agriculture technologies with the community. According to RARS, the 2016 Poopali, drew in over 500,000 people in just the first week of their 14 day long agricultural exposition, bringing a huge boost to the local economy by providing over 350 stalls for vendors selling value added goods, garden plants, agricultural implements, and more. Not to mention, RARS is one of the main employers in the region with 800 employees, which is not surprising given that agriculture is the backbone of the economy.

Commercial & Economic

In speaking to one woman's focus groups, numerous participants claimed that their children were working abroad in the Middle East due to the lucrative wages that were available there. This is evidence of the high amount of remittances being brought to Kerala from the Gulf that was discussed earlier in the literature. When asked who the wealthiest members of society are in the region, one interviewee noted that "those who work in the Gulf and those in the quarrying industry tend to make the most".

Eco-tourism also seems to be a major asset to the Wayanad economy, drawing in national and international tourists, and providing a demand for restaurants, business, and hotels in the region. There are many new eco-tourism developments that are growing in the region. The following is a list of eco-tourism destinations within Wayanad which has been compiled from local government websites as well as travel sites such as TripAdvisor:

Tholpetty Wildlife Sanctuary

Muthanga Wildlife Forest

Kuruva Islands

Banasura Sagar Dam

Thirunelli Temple

Vellarimalla & Soochipara Waterfalls

Mananthavady Hill Station/Begur Forest

Wayanad Heritage Museum

Chembra Peak

Nellimala Viewpoint

Heart Lake

Kanthapara Waterfalls

GAPS IN SERVICES

I have now documented both the assets and challenges related to environmental, economic, and social indicators within the community. However, it was very challenging to actually measure the impact of any of the interviewed organizations in achieving their program goals. Therefore, instead of trying to determine which services are fulfilling the needs of the community, I will provide a list of community identified missing services grouped according to the community identified challenge they address.

Environmental

I have outlined a list of missing services which I identified through interviews, surveys, and focus groups with local community members. Table 14 is a list of services that are lacking related to the environmental challenges that were discussed earlier.

	Missing Services
Climate Change	Energy and emissions reduction, adaptation support.
Waste	Recycling, Waste Collection, General waste and sanitation awareness.
Synthetic Pesticide & Fertilizer Use	Synthetic alternatives knowledge dissemination, organic transition loan fund for farmers, increased access to viable biofertilizers and promotion of organic practices.
Deforestation & Land Change	Improved forest areas for wildlife, fair regulation and monitoring of the quarry industry.
Loss of Biodiversity	Increased awareness and preservation of rare and medicinal varieties of species in the region.
Water	Watershed monitoring of water table levels, irrigation.
Ecosystem Imbalances	Increased forestry management to increase water, fruit trees, and wildlife needs within forested areas. Increased trainings on bio-fertilizers and natural pest control mechanisms.

Table 14: Environmental missing services

One specific recommendation that came from an interview at KVK was that there should be a revolving loan fund that supports farmers in transitioning to organic practices, noting that while the government has made Organic a goal, they have done little thus far to make it a reality

for local people. Other missing services include waste management; there is only one waste treatment center with a small capacity in Wayanad and only one organization, Shreyas, that offers services related to waste management. According to household surveys and interview results, the burning of trash continues to be a common practice within households despite its toxic effects on air quality. Synthetic fertilizers and pesticide use was also an issue of great concern. While there are organizations working to transition farmers into more organic practices, there is no way to know the extent of their efforts from this analysis.

Another primary issue of concern is related to water, with a specific demand for increased irrigation for farmers as well as increased water access, in particular for disadvantaged people. While climate change was considered to be one of the greatest challenges, it is difficult to address the impacts of its effects on small farmers without large scale interventions such as increased irrigation to farmland.

Social

In Table 15 I have provided a list of missing social services that the community identified through interviews, surveys, and focus groups.

	Missing Services
Substance Abuse	Alcohol and drug addiction support.
Women's Issues	Domestic Abuse Centers, Decreased alcohol abuse, and Women empowerment.
Healthcare	Low cost emergency health care services such as a Public Medical College, increased insurance coverage.

Tribal Issues	Decrease the number of school drop-outs and increase sanitation and water access. Provide more opportunities for tribals to generate revenue through value-added goods, etc while preserving their heritage and culture.
Infrastructure	Better transportation and road systems.

Table 15: Social missing services

Health is still an issue of prime concern in the region, demonstrated by the high number of times it was identified as a challenge. Wayanad still lacks a low cost emergency health care provider such as a public medical college, forcing urgent care patients to travel up to four hours to receive affordable emergency care (WSSS Interview). Cancer and sickle cell anemia were identified by interviewees as problems along with limited access to health insurance along with little access to healthcare insurance.

Despite the diverse religious composition of the community, there is currently no organization that is focused on addressing social services, such as marital or substance abuse counseling that is not religiously affiliated. Shreyas, WSSS, and Aksheya who I identified as the primary organizations providing social services are all Christian based organizations. This could potentially be off-putting to someone of another religious affiliation, especially given that the 76% of the population identifies as non-christian (Wayanad District 2015, Upendranadh, 2008). I also found that there was a discrepancy between what the larger community found to be as issues that tribals were experiencing versus what tribals identified as problems they were experiencing, which demonstrates a need to engage them directly in development planning.

Economic

After analyzing notes from interviews both at an organizational and household level, I have compiled the following list of economic services that are still in demand, in relation to the category under which they fall which are demonstrated by Table 16.

	Missing Services
Market Conditions	Increased farmer control over market prices and conditions, information dispersal on market predictions and government schemes aimed to benefit farmers, increased market accessibility.
Debt/Loans	Increased financial literacy and increased access and awareness of available government schemes and loan programs, particularly those available for farmers and women.
Unemployment	Increased job opportunities particularly for youth and women.
Gender Inequality	Increased engagement of women in government and work force as well as a decrease in the wage gap.

Table 16: Economic missing services

It was apparent through interviews that debt and loans continue to be an issue of concern, and given the agricultural nature of the community no doubt correlates to market conditions, although climate may also be a contributing factor. In a focus group with farmers, they explicitly

asked for ways to have more control over the prices of their goods and increased access to information about market conditions and future market prices for their goods.

RECOMMENDATIONS

Wayanad has an existing network of organizations and institutions that aim to improve the environmental, social, and economic conditions. While engaging directly with key members of Wayanad's capacity network by interviewing seven organizational leaders, I found that there are still a great number of challenges that require attention. However, I also found that there are existing services, programs, and government schemes specifically dedicated to providing sustainable living opportunities within the region. This demonstrates a viable **capacity** to enhance sustainable livelihoods within the region through the improvement and expansion of existing resources.

Based upon my analysis of the identified challenges, existing assets, and current gaps in services, I recommend the following action items to any organization interested in promoting sustainable livelihoods within the region. These recommendations have been produced after hearing directly from community members about their needs, desires, and expressed missing services. To remain consistent with the rest of my findings, they are categorized into environmental, social, or economic constructs.

Environmental

- Increase the availability and knowledge of viable alternatives to synthetic pesticides and fertilizers through trainings on natural pest control mechanisms and bio-fertilizers.
- Increase access to trustworthy bio-fertilizers and natural pest control products.
- Invest in clean and sustainable waste management facilities.
- Provide education on best practices for waste management.

- Promote and invest in the conservation of rare species within Wayanad and Kerala, in particular of medicinal plant varieties.
- Work with existing organizations such as MSSRF, WSSS, Organic Wayanad, Syam Farms, and RARS, that are implementing biodiversity and conservation strategies.
- Make an effort to promote and plant rare and endangered species and crop varieties, particularly of medicinal plants.
- Promote and invest in renewable energy technologies and innovations.
- Advocate for fair regulation of the quarrying industry.
- Promote sustainable land use planning and policies to address deforestation, human-wildlife conflict, and land fragmentation.
- Improve access to irrigation, particularly for farmers, while monitoring the watershed withdrawal rates to ensure the current and future sustainability of water in the region.

Social

- Increase support available to women experiencing domestic abuse and violence.
- Engage both males and females in strategies to prevent domestic abuse and violence against women.
- Provide alcohol and drug addiction support and increase drug and alcohol education and awareness.
- Provide scholarships and loans for education and skill training to ensure that even the most disadvantaged populations can engage in education without having to worry about feeding their families at the same time.
- Provide basic education and confidence boosting trainings to illiterates so that they can participate in further skill development trainings.
- Provide non-religiously affiliated counseling services to individuals and families.
- Connect community members with affordable health insurance programs.
- Invest in public infrastructure projects such as a public medical college, transportation services, and waste management facilities.
- Increase participation of both women and tribals in planning processes, organizational leadership, and government.

Economic

- Connect and educate farmers on existing government projects and loan programs aimed at supporting them.
- Increase farmers' control over the prices of their goods by developing innovative ways to connect them to the market.
- Provide farmers with information about market conditions and predictions.
- Decrease the wage gap by paying employees based upon variables other than gender, such as inputs and outputs. (To ensure equality will require valuing women's time and work as equal to that of a man).
- Provide direct and indirect employment opportunities particularly for women, tribals, and youth.
- Provide community members with relevant financial literacy as well as technical and business skills in order so that they may increase their market accessibility and economic well-being.

After spending time working on this project and personally speaking to community members, there were certain conditions which I felt warranted additional concern. I personally have identified the following as the top three areas of action that I would prioritize within the community:

- (1) Increased dialogue, services, and support with both men and women in order to prevent the devaluation of women as well as domestic abuse and violence against women.
- (2) Increase access to education, skill development, and trainings particularly related to organic farming, agroecology, and business and marketing.
- (3) Invest in waste management facilities and promote public sanitation campaigns.

In addressing the areas of action, I recommend that organizations foster a sense of dignity in the lives of those they are working with by building upon components of dignity that were found through this study. They can do this by creating incentives through educational achieve-

ments, awards, and familial gatherings while most importantly creating opportunities for the community to take part in supporting each other in moments of need.

LIMITATIONS

In engaging with NGO's, I found that there was a diversity in availability of information documenting the services they provide. Some of the organizations have available information about their programs online, others only had printed materials (KVK, RARS), while Aksheya had neither. It also became apparent that it would be difficult to gage the actual effectiveness of each organization based upon interviews and information gathered through materials given that NGO's are forced to "sell" themselves in order to secure funding for their continued existence. Their advertised information made it extremely difficult to measure and analyze the actual effectiveness of these organizations in addressing some of the challenges within the community, and therefore outside the scope of this initial assessment of existing services.

In exploring sustainable livelihood indicators at a household level, I relied on the Agricultural Worker Instrument that I developed. Given that I was primarily interested in agricultural services, assessing health care facilities and their services was outside the scope of this analysis. In interpreting the results of this study, it's important to bear in mind that my goal in constructing the inquiry was to give a voice to groups that are frequently not well represented, so my sampling strategy was purposeful and not necessarily representative of the population as a whole. If someone were interested in pursuing a household survey of this sort, there are modifications of the existing instrument that would need to be addressed in the future.

It was only after conducting my fieldwork for this thesis evaluation that I came across a valuable study from 2008 (Upendranadh, 2008), which analyzed several of the development in-

dicators I aimed to understand through my study that was comprehensive of the entire Wayanad population. If I had found this study previously, I likely would have identified different gaps in information than in my initial literature review. Lastly, as with any project using translation, that process can be a source of error. The fact that my translator was from the area, male, and privileged, could have also made an impact on how respondents, particularly woman, responded to some questions.

CONCLUSIONS

Entering into this research project, my goal was to provide a platform for the Wayanad community to self-identify their challenges (needs), as well as document the existing resources and assets available within the community in order to provide recommendations to an organization dedicated to rural development and sustainable living within the region. I was able to consolidate the community identified challenges into a manageable system to identify areas of top concern. I found that synthetic fertilizer and pesticide use, challenges faced by women such as domestic abuse and wage discrepancies, as well as unfavorable market conditions are issues of key concern to the community. Not to mention climate change, land changes, alcohol abuse, and human health concerns. However, I also found that there is a large capacity to address some of these concerns already existing within the community, which appears to be very well connected to government. Wayanad's location within the democratically socialist state of Kerala provides networks and opportunities that may not be present in other regions of the country. On the ground level, one can directly see the trickle down effects of sustainable development goals and Kerala's participatory planning programs. The involvement of local women in self-help groups and the participation of farmers and agricultural workers in government positions and projects are both positive examples of the sustainable livelihood capacity that exists within the region.

Despite the substantial amount of literature that characterizes Wayanad as a region of extreme agrarian distress, I found that this view of the region is quite outdated. As two interviewees noted, “farmer suicides were a problem in 2008, however that is not the case anymore”, which possibly demonstrates the capability of the existing network of organizations working to address agrarian distress within the community, most notably RARS, KVK, Organic Wayanad, Shreyas, WSSS, and MSSRF. While I was able to speak to seven organizational leaders providing social, environmental, and economic services within Wayanad, there are additional community based organizations providing services that were not included in this analysis; I have made an effort to include them in *Appendix D: Community Asset Map* as well as *Appendix E: Organizational Resource List*. I was able to identify that there are organizations whose mission is to provide sustainable livelihood opportunities and their philosophies are in alignment with the values of both the community, as well as the international food and sustainable development movements.

It proved to be quite challenging to measure the effectiveness of local organizations in addressing community needs, and thus my research was not able to take this into consideration. Nor am I able to predict the future ability of these organizations to carry out their mission given the changing context under which organizations in India are now operating under the Modi government. Nonetheless, I feel hopeful for Wayanad in ensuring a sustainable future of the region’s people and environmental resources. While existing work should be expanded upon to confront the remaining challenges, I am much more convinced of the capacity for this community to address the challenges that face them in the years to come, possibly serving as a model for the rest of the nation.

APPENDIX A: Agricultural Worker Instrument

(Malayalam version is also available upon request)

WAYANAD SUSTAINABLE LIVELIHOOD COMMUNITY LEVEL ASSESSMENT AGRICULTURAL WORKER SURVEY INSTRUMENT

The instrument I will be discussing here is the Agricultural Workers Instrument to be used in assessing livelihoods for potential future beneficiaries of the TGGFCT (Paniya Tribals and Agricultural Workers).

Evaluation Questions: This survey instrument aims to identify the current conditions related to livelihoods for potential future beneficiaries of TGGFCT. The organization can then better understand how to develop its programs and what gaps in services within the community exist. It also provides a data baseline to measure the progress of the programs in the future. My guiding research questions for this instrument include:

- What are the greatest issues related to sustainable livelihoods facing the community near the Green Gardens Farm operated by TGGFCT in Wayanad, Kerala?
- What are the needs and demands related to sustainable livelihoods as determined by the community?
- What are the current economic, social, and environmental conditions of future potential beneficiaries?
- What programs should be developed by TGGFCT to improve the livelihoods of people in this region?

Sampling:

This instrument will be used to survey twenty local agricultural workers from the ages 18-65 years old. I will attempt to interview twice as many female agricultural workers as male, and try to have at least half of agricultural workers coming from the Paniya Tribe, described to be a highly marginalized group (Nidheesh, Munster, 2008, Ramachandran, 2005). The rationale behind this is to adopt feminist principles in evaluation by “placing central importance on the lives and experiences of marginalized groups” (Cassaro and Hood, 2002). Given the time and budget constraints of this evaluation, sample pool size will not be large enough to represent population total, but will rather be a convenience sample to generate some data metrics and understanding of the current local situations.

Participants will be recruited by contacting local organizations and stopping by local farms to invite farmers to participate in a survey and interview or group discussion. Several research collection dates will be planned and organized and marketed throughout the community.

Data Collection Process: Surveys will be given in person in a group setting and privacy will be encouraged while filling out the surveys. The survey should not take more than 30 minutes to complete. If participant is illiterate, survey can be conducted orally one on one, with a translator, in a separate area. It is likely that many of the surveys will have to be administered one on one with a translator, the PI will train the translator in how to properly administer surveys one on one before collecting any data. In order to collect this type of data, a full IRB review is necessary and various steps will be taken to ensure the confidentiality and security of all participants. The translator will have previously agreed and signed a document ensuring that they will not reveal any confidential information that they hear in their translation work. Surveys are to remain anonymous and all of the raw data from surveys will be collected and immediately placed into a spreadsheet which no one except the PI will have access to. Any identifying information will be stored separately from raw survey data and focus group interview responses. Data collected from this survey will only be presented as a summary to avoid identifying answers. Survey participants will be advised that the survey is voluntary and if they agree to participate, they can skip any questions that they do not want to answer.

Pilot Testing: This survey will be pilot tested in several ways: First with the Malayalam translator in Boston and again once arriving to Kerala. The Boston translator will work very closely with PI to ensure translations are carried out to probe at desired elements of question. Then survey will be administered to a local Wayanad resident who speaks both English and Malayalam to be able to work with PI to ensure that translations make sense in local context. Then a pilot test survey will be administered with one agricultural worker to determine if any confusion is fostered after which questions will be edited if needed. IRB will be updated after pilot tests of any changes in language and questions. Potential edits include potential category changes in order to fit desired population for example income rates or better examples of local community organizations that help display the assets within the community, and types of houses and types of sanitation facilities). Pilot tests will need to ensure that survey does not take more than 30 minutes to complete even if it has to be administered orally, if participant is illiterate.

WAYANAD SUSTAINABLE LIVELIHOOD COMMUNITY LEVEL ASSESSMENT AGRICULTURAL WORKER INSTRUMENT

Directions for Instrument Administrator

Read aloud the following statements before distributing surveys to participants:

This research is being conducted to assess the livelihoods of Wayanad agricultural workers and is being carried out by a graduate student from the United States, Allie Platt. The purpose of this study is to hear FROM YOU about your ideas to improve your community. In order to do this, I will have you respond to survey questions related to areas including: Social, Economic, and Environmental Considerations. Please keep in mind, your involvement in this research is completely voluntary. This means that you have the option to not complete this survey. If you choose to complete the survey, you have the right to answer all of the questions or only the questions that you want to answer. The survey is anonymous: Your name will not be on the survey, so answers cannot be traced back to you through it. Please be as candid as you can be.

After completing the survey, I ask you to join us for an interview or group discussion. I expect that the survey and discussion will take no longer than 90 minutes in total. With your permission, I will audiotape the interview/discussion solely for the purpose of accurately transcribing the conversation. The audiotapes as well as the transcriptions will be stored securely on my computer which is passcode protected and will only be used by me in analyzing my research. Only research summary findings will be used for my final report and my presentations at various conferences and at Tufts University.

Please take a moment now to decide if you are comfortable with participating in the survey and group discussion. If you decide to participate, please come forward to obtain a survey and let Allie know if you also agree to be audio recorded during the interview/group discussion. If you can read and write we will now hand you pen for you to complete the survey on your own. If you would prefer to complete the survey orally, we have several people who can administer the survey one on one, please just let us know when you come to get your survey if that's what you prefer.

After completing the survey, which we expect to take only 30 minutes, we will reconvene for an interview or group discussion.

If you have any questions, please feel free to approach any of us to ask questions.

Distribute Surveys and Confirm Audio Tape Consent or not for each participant using Waiver of Documentation Forms.

**CONSENT TO PARTICIPATE IN RESEARCH STUDY WAIVER
Agricultural Worker and Paniya Waiver**

(To be signed before survey is administered)

This research is being conducted to assess the livelihoods of Wayanad agricultural workers and is being carried out by a graduate student from Tufts University in the United States, Allie Platt. The purpose of this study is to hear FROM YOU about your ideas to improve your community. In order to do this, I will have you respond to survey questions related to your daily life. Please keep in mind, your involvement in this research is completely voluntary. This means that you have the option to not complete this survey. If you choose to complete the survey, you have the right to answer all of the questions or only the questions that you want to answer. The survey is anonymous: Your name will not be on the survey, so answers cannot be traced back to you through it. Please be as honest as you can be.

After completing the survey, I ask you to join me for an interview or group discussion. I expect that the survey and discussion will take no longer than 90 minutes in total. With your permission, I will audiotape the interview/discussion solely for the purpose of accurately transcribing the conversation. The audiotapes as well as the transcriptions will be stored securely on my computer which is passcode protected and will only be used by in analyzing my research. Only research summary findings will be used for my final report and my presentations at various conferences and at Tufts University.

Please take a moment now to decide if you are comfortable with participating in the survey and interview/group discussion. If you decide to participate, please come forward to obtain a survey and let Allie know if you also agree to be audio recorded during the interview/group discussion. If you can read and write we will now hand out a pen for you to complete the survey on your own. If you would like to, or prefer to, complete the survey orally, we have several people who can administer the survey one on one, please just let us know when you come to get your survey.

After completing the survey, which we expect to take only 30 minutes, we will reconvene for an interview or group discussion.

You may ask more questions about the study at any time. Please contact Allison Platt at allison.-platt@tufts.edu or by contacting Laiju from TGGFCT. This study has been approved by the Institutional Review Board at Tufts University, so you may contact the IRB Administrator, Lara Sloboda, by calling +1 617 627 3417 or email: lara.sloboda@tufts.edu.

_____		_____	
Signature of Person Obtaining Consent		Date	
The participant agrees to be audio-taped	YES	NO	Initial _____

AGRICULTURAL WORKERS SUSTAINABLE LIVELIHOOD SURVEY QUESTIONS

Please fill out the questions below about your daily life, including how you earn your living, manage your household and access basic services. Again please note you have the right to answer all of the questions or only the questions that you want to answer, however my research will be more valuable if you answer all the questions. If you have any questions or need clarification as to how to answer, please wave over the Principal Investigator (Allie), or the translator.

BASIC DETAILS

1. Gender: _____ Male _____ Female

2. Age (approximate): _____

3. Marital Status
 - a. Single
 - b. Married
 - c. Widowed

4. Details of Your Household Members.

For example, if you have three children, write Child 1 in the first column, and then note the answers to the following columns in the same row for that child, then write Child 2 in second row, first column.

Relationship to you	Age (years)	Sex (M/F)	Occupation	Education	Monthly Income (Rs)
Ex. child 1					

--	--	--	--	--	--

EDUCATION/SKILLS

5. In terms of how well you can read, can you? (Please circle one)

- a. Read
- b. Sign
- c. Read & Sign
- d. Read & Write
- e. None

6. What is the highest level of schooling that you have completed? (please circle one)

- a. None
- b. Lower Primary (1st-4th standard)
- c. Upper Primary (4th-8th standard)
- d. Secondary/High School (8th-10th standard)
- e. Higher Secondary (10th-12th standard)
- f. Other: _____

6b. Private or Public Schooling? ____ Private ____ Public

7. What types of trainings or skill development have you received? (Skills could be on tailoring, electrical work, farming, driving, electronic repair, computer/typing, farming, welding, livestock, etc)

Skills in?	When?	Where/from whom did you receive training?

8. What types of training would you be interested in receiving? (Circle all that apply)

- a. Tailoring/Embroidery
- b. Organic Farming
- c. Cutting/Stitching
- d. Masonry
- e. Carpentry
- f. Welding
- g. Plantation management
- h. Livestock management
- i. Gardening
- j. Compost
- k. Renewable energy
- l. Water management
- m. Computer Skills
- n. Business Management
- o. Other? (Please specify)_____

9. How many hours per day do you work?

- a. Paid employment: _____
- b. At home (cooking, caretaking cleaning): _____

10. How many days per week do you work?

- a. Paid employment: _____
- b. At home (cooking, cleaning, etc): _____

11. Describe your paid employment status?

- a. Full Time
- b. Part Time
- c. Occasional/Seasonal
- d. No paid employment

12. If you have paid employment

- a. Where do you work? _____
- b. What is your occupation title? _____

13. Are you able to take vacation or time off if you need to? _____ Yes _____ No

14. If yes, how often are you able to take this time off (Days/Year): _____

15. How happy with your employment conditions are you?

- a. Very

- b. Somewhat
- c. A little
- d. Not at all

INCOME/ASSETS

16. What is your weekly income? (circle one)

- a. 0-500 rupees
- b. 500-1000 rupees
- c. 1000-1500 rupees
- d. 1500-2000 rupees
- e. 2000-2500 rupees
- F. More/other: _____

17. Over the past year, how much money, if any, have you been able to save?

18. Do you or your family own any land? How much (in cents or acres)? Who is primary owner?

19. What best describes your housing situation/home?

- a. Self- Owned
- b. Rented
- c. Rent Free
- d. Owned by Family Member

20. Over the last week on average how many hours per day did your home have electricity?

21. Do you or someone in your household own any of the following items?

Item	No. of Items	Primary Household User	Condition
Television			
Motorbike/Scooter			
Bicycle			

Gold			
Silver			
Electric Fan			
Rickshaw			
Gas Stove			
Other Major Asset? _____			
Other: _____			

22. Do you own any livestock/animals? (If yes, please note the kind of animal the number you have.)

- a. Animal: _____ How many (#)?: _____
- b. Animal: _____ How many (#)?: _____
- c. Animal: _____ How many (#)?: _____
- d. Animal: _____ How many (#)?: _____
- e. Animal: _____ How many (#)?: _____

23. Do you have any sources of debt or loans? ___ Yes ___ No

24. If you do have sources of debt or loans, from where? (Please circle all that apply).

- a. Commercial Banks
- b. Lending Groups
- c. Cooperatives
- d. Money Lenders
- e. Other ? Specify: _____

25. How satisfied are you with your current economic conditions?

- a. Very
- b. Somewhat satisfied
- c. Not Satisfied

HOUSEHOLD

26. Who in your household makes decisions about household purchases? (circle one)

- a. You
- b. Family Member (specify, ie: spouse) _____
- c. Both
- d. Other (specify): _____

27. Who in your family does most of the household purchases?

- a. You
- b. Family Member (specify, ie. Spouse): _____
- c. Both
- d. Other (specify): _____

28. Think about the food your family normally eats over the past month. Where does most of it come from?

- a. Market (indicate name): _____
- b. Home garden
- c. Farmland
- d. Friends/Neighbors
- e. Other (please specify) _____

29. If you use a market, how close is it to your home or work-place (in minutes travel time)?

If yes, how do you get there (Walk, motorbike, bus, etc)?

30. Where do you purchase most of your non-food items?

HEALTH

31. How happy are you with your current diet/food needs?

- a. Very Satisfied
- b. Satisfied
- c. Moderate
- d. Not satisfied
- e. Unsatisfied

32. How often do you go hungry?

- a. Once per day or more

- b. A few times per week
- c. Once per week
- d. A few times a month
- e. Rarely
- f. Never

33. What is the source of your drinking water?

- a. Bottled
- b. Piped water to dwelling
- c. Piped water to yard/plot
- d. Public tap/standpipe
- e. Borewell
- f. Protected dug well
- g. Unprotected dug well
- h. Rainwater collection
- i. Cart with small tank
- j. Tanker truck
- k. Surface water (river, lake, pond, stream, etc)
- l. Other (specify): _____

34. Are there any times in which water is unavailable in a given week? If yes how many hours/week? _____

35. What is the source of water for other purposes (bath, wash, cooking, etc?)

- a. Piped water to dwelling
- b. Piped water to yard/plot
- c. Public tap/standpipe
- d. Tubewell/Borehole
- e. Protected dug well
- f. Unprotected dug well
- g. Rainwater collection
- h. Cart with small tank
- i. Tanker truck
- j. Surface water (river, lake, pond, stream, etc)
- k. Other (specify): _____

36. Who usually gets water for your household (circle all that apply)

- a. Adult Woman
- b. Adult Man
- c. Female Child (under 15 years)

d. Male Child (under 15 years)

37. How long does it take to go there, get water, and come back?

a. No of Minutes: _____

38. What kind of toilet facility do members of your household usually use?

a. pit/latrine with slab

b. pit/latrine without slab/open pit

c. bucket

d. composting toilet

e. flush/pour flush to:

i. sewer system

ii. septic tank

iii. pit latrine

iv. elsewhere

v. unsure

f. no facilities or bush or field

g. other (specify): _____

39. Do you share this facility with other households? ____ Yes ____ No

a. If yes, how many households? _____

ENVIRONMENTAL: Now we will talk about your environmental conditions in your area.

40. Are you concerned about pollution in your community?

a. Not at all

b. A little

c. Somewhat

d. A lot

41. How much waste does your household generate ?

a. None

b. A little

c. Some

d. A lot

42. How does your household manage waste? (circle all that apply)

a. Burn

b. Toss in street

c. Compost

- d. Store at home
- e. Reuse
- f. Bury
- g. Garbage Collection Point (where): _____
- h. Other (specify): _____

43. How aware are you of bio-fertilizer use?

- a. Not at all
- b. Have heard of it
- c. Have seen it used
- d. I use bio fertilizers

44. Are you concerned that pesticides and fertilizer can cause increased soil degradation?

- a. Not at all
- b. A little
- c. Somewhat
- d. Very familiar

45. Do you use or are you exposed to fertilizers or pesticides on a regular basis?

- a. Yes
- b. No

46. Are you concerned about the human health risks associated with high pesticide exposure?

- a. Not at all
- b. A little
- c. Somewhat
- d. Very familiar

COMMUNITY SERVICES: Now let's talk about your community and the services you and your family uses.

47. How far is the closest school to your home? (min it takes for you to get there using your transit method)

48. What types of community organizations are you involved with (ie. church, non-profit, community gathering space, agricultural organization)? Please list them below.

- a. Organization Name: _____
- b. Organization Name: _____
- c. Organization Name: _____

- d. Organization Name: _____
e. Organization Name: _____

Thank you for your participation in the survey! If you are interested, I will have the summary of results from this survey completed in May of 2016. If you would like the results, please ask Laiju from TGGFCT for the information.

Now, if you still have time, we invite you to join us for a discussion to better understand your ideas for how to better improve your community and livelihood.

AGRICULTURAL WORKER INTERVIEW/GROUP DISCUSSION QUESTIONS

This is a sample list of questions to ask during interviews and group discussions related to the following categories: Defining Problems, Assets, and Community Services. These will be done in either a group or individual interview set up.

Directions:

Confirm that all participants have already indicated that they consent to participate in research and be audio recorded and that have already completed survey component.

Read aloud the following statement:

Thank you for completing the survey, now we will begin a (interview/discussion) in order to better understand your ideas related to your community. Again, you may answer or respond to only the questions that you want to, your participation is completely voluntary. I will begin to audio record all responses from here. Before I begin, I would like to confirm that everyone consents to being audio recorded for translation purposes again.

Wait for nods/approval.

If done in group discussion please indicate the following ground rules for the discussion:

1. WE WANT YOU TO DO THE TALKING.

We would like everyone to participate in the conversation, if you notice you are speaking a lot make space for others to speak. If you notice you haven't spoken much, please speak up, we want to hear all of your opinions.

2. THERE ARE NO RIGHT OR WRONG ANSWERS

Every person's experiences and opinions are important. Speak up whether you agree or disagree. We want to hear a wide range of opinions.

3. WHAT IS SAID IN THIS ROOM STAYS HERE

We want folks to feel comfortable sharing when sensitive issues come up.

4. WE WILL BE AUDIO RECORDING THE GROUP

We want to capture everything you have to say. You will remain anonymous, we will not identify anyone by name in our report.

Turn on audio recording device and begin asking participants) questions:

Questions

DEFINING PROBLEMS

1. What do you see as the biggest concerns (economic, social, and environmental) facing your community - which should be prioritized?
2. What hardships/challenges do you as a woman encounter, if any, on a day to day basis?
** This question will only be asked if females only are present.
3. What hardships/challenges do you as a Paniya tribal encounter, if any, on a day to day basis? ** This question will only be asked in Paniyas only are present.
4. How aware are you about the connection between the health of your local environment and your well-being?

ASSETS

5. Where do you find the greatest sense of community in your life?
6. What gives you the greatest sense of pride/dignity in your life?
7. What special skills do you have?
8. Do you have an opportunity to share these skills with others?

COMMUNITY SERVICES

9. Do your children go to school? If yes, where? What is quality of education? Until what level is offered? If no, why?
10. What services offered/available in your community are you the most satisfied with?
11. What services are you least satisfied with?
12. What do you see as the solutions to some of the challenges facing your community?

13. What do you see as barriers to your success in the community?
14. What do you see as opportunities that exist within the community that could be expanded upon?

APPENDIX B: Evaluation Planning Grid of Agricultural Worker Instrument

Evaluation Questions	Constructs/ Categories of Info	Data Sources	Analysis Approach
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<ul style="list-style-type: none"> • What are the greatest issues related to sustainable livelihoods facing agricultural workers in Wayanad, Kerala? • What are the needs and demands related to sustainable livelihoods as determined by agricultural workers? • What are the current economic, social, and environmental conditions of future potential beneficiaries? • What programs should be developed by the TGGFCT to improve the livelihoods of agricultural workers in this region? <p>* In these questions sustainable is measured using the triple bottom line an</p>	<p>Economic</p> <ul style="list-style-type: none"> -purchasing power -debt -ownership -household assets -skills -working conditions <p>Social</p> <ul style="list-style-type: none"> -education -participation/empowerment -household decision making -labor distribution -dignity/pride -family -community -health -gender equity <p>Environmental</p> <ul style="list-style-type: none"> -food/nutrition -water -sanitation -electricity/energy -environmental awareness -agricultural practices <p>* Important to recognize these categories intersect more than they should be separated, as sustainability lies at the intersection of all three components.</p>	<p>Economic Questions: 8,9,10,11,12, 13,14,15, 16, 17, 18, 21, 22, 23, 24, 25,</p> <p>Social Questions: 1,2,3,4,5,6,6b ,9, 26, 29, 30, 36, 47, 48</p> <p>Environmental Questions: 20, 28, 31, 32, 33, 34, 35, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46</p>	<p>Economic</p> <p>Calculate and measure average income and compare genders.</p> <p>Calculate average savings, debts, and household assets (ownership). Compare ownership and assets across genders.</p> <p>Analyze how participants perceive working conditions.</p> <p>See what skills/trainings exist within community and which types of skills future beneficiaries would be interested in receiving.</p> <p>Social</p> <p>calculate for hours worked using both home labor time vs work labor time.</p> <p>understand gender and marital status impact on decision making</p> <p>document existing community organizations and services</p> <p>calculate average education level</p> <p>calculate average number of children</p> <p>Survey question on pride/dignity, coding responses</p> <p>Environmental</p> <p>-Calculate numbers and percentage of participants exposed to pesticides, using bio fertilizer, and pollution concerns.</p> <p>Document current water and sanitation access and services, waste management practices, and electricity use.</p>
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APPENDIX C: Community Leader Instrument

WAYANAD SUSTAINABLE LIVELIHOOD COMMUNITY LEVEL ASSESSMENT TGGFCT EMPLOYEE SUSTAINABLE LIVELIHOOD EMPLOYEE INSTRUMENT

The instrument I will be discussing here is the Community Leader Instrument to be used in assessing available community assets and gaps in services.

Sampling:

Members of the following organizations will be contacted through Recruitment Script used either by email, letter, or phone call. I will recruit members from the following organizations:

Organic Wayanad: Organization dedicated to socio-economic development of small and marginal farmer communities of Wayanad.

Ms. Swaminathan Research Foundation Community Agrobiodiversity Centre (MSSRF): Aims to address pertinent issues of sustainable agriculture rural development through agrobiodiversity.

Shreyas Social Service Centre: The official social development organization of the Malankara Catholic Diocese of Bathery to uplift the poor and marginalized. It is one of the leading NGOs working in South India for the development of Marginal Farmers, Tribal, Women, Children and Senior Citizens, started in 1979 and registered since 1986.

Wayanad Social Service Society: WSSS aims to promote socio-economic empowerment targeted towards tribals, women, small and marginal farmers through participatory development interventions.

Aksheya Women's Welfare Association: Limited information available online.

Krishi Vigyan Kendra (KVK)- conducts training programmes, frontline demonstrations, participatory action research programmes based out of Kerala Agricultural University.

Regional Agricultural Research Station (RARS): Research Station responsible for the generation and transfer of technology related to rice and rice based cropping systems, pulses, vegetables, organic farming and seed technology.

Data Collection Process: Semi-structured interviews will be conducted with local organization and community leaders to better understand the already existing programs and assets within the community. A list of potential questions that will be used in conducting interviews with these communities is listed below:

WAIVER OF DOCUMENTATION FOR INFORMED CONSENT COMMUNITY LEADERS

My name is Allison Platt, and I am a graduate student at Tufts University in the United States. I had the opportunity to volunteer at the Green Gardens Estate in Wayanad in April 2013. I have returned to do some research that will help me graduate and hopefully help guide the work of a local organization, the TGG Foundation Charitable Trust (TGGFCT). If you are age 18 or older, I would like to ask you to participate in my research study.

The purpose of this research project is to learn more about the current living conditions of the local community and the people of the Wayanad region, particularly those involved in the agricultural sector. I am hoping to assess the needs, wants, and assets of this region related to environmental, economic, and social concerns. The information collected from this research will be used to help develop ideas, programs, and solutions that can be implemented by TGGFCT.

The format of this interview will be a discussion. I expect that this discussion will take no longer than 60 minutes. With your permission, I will audiotape your responses solely for the purpose of accurately transcribing the conversation. Given your position in the community I would also like to be able to cite your responses in my work, crediting them to your name, if you allow me permission to use your name.

Please know that you do not have to answer any questions or discuss any topics that make you feel uncomfortable or that you simply do not want to answer. TGGFCT and the other employees of the organization will not be able to see any answers to these questions or identify who gave which answers; only summary data will be used for my paper and recommendations for the TGGFCT.

There are no direct costs or benefits to you for your involvement with participation in this research. My final report will be presented in May 2016 at my University and will also be presented to the TGGFCT in the form of a report.

You may ask more questions about the study at any time. Please contact Allison Platt at allison.platt@tufts.edu or by contacting Laiju from the TGGFCT. This study has been approved by the

Institutional Review Board at Tufts University, so you may contact the IRB Administrator, *Lara Sloboda*, by calling +1 617 627 3417 or email: *lara.sloboda@tufts.edu*.

Signature of Person Obtaining Consent		Date
The participant agrees to be audio-taped	YES NO	Initial
The participant would like his/her name to be used	YES NO	Initial

COMMUNITY LEADER INTERVIEW QUESTIONS

These questions to be asked in a semi structured interview in a location deemed appropriate by interviewee. Some or all questions will be asked, which will vary depending upon community member being interviewed and their expertise.

- Can you please describe your organization and your role within the organization?
- What is the mission (goal) of your organization?
- What do you think are the greatest assets that the Wayanad community has?
- What are some of the greatest economic challenges that you see in the community?
- What are some of the social challenges that you see?
- What are some of the environmental challenges that the community faces (pollution, water access, fertilizer use, weather conditions)?
- What do you see as the biggest concerns facing the community (Prioritize)?
- How do you see your organization addressing these issues?
- What challenges have you faced in implementing programs in the area?
- What successes have you achieved and what did you see as being crucial for their success?
- What services in the community are you most/least satisfied with?
- What services do you think this community is still missing?
- What is your perception of TGGFCT?

APPENDIX D: COMMUNITY ASSET MAP

This map is a resource designed to supplement the research and needs assessment I carried out for my thesis, Sustainable Livelihood Community Level Assessment of Wayand, Kerala. It is to be used as a resource for TGGFCT in implementing their sustainable development programs in order to identify future partners as well as gaps in services for the community in a geographic sense. This map is up to date as of May, 2016 and will not be revised in the future to reflect any possible changes or additions of community assets.

To view the map visit the following link:

<https://www.google.com/maps/d/edit?hl=en&authuser=0&mid=zMPot9Fv1YHs.k-kKAV4ztsiw>

I have organized the Community Assets of Wayanad using the following key, which vary in color based upon the category they fall under (Organizations interviewed, other organizations, environmental assets public services, economic assets, cultural assets, healthcare, and ayurvedic services).

-  Environment Focus (water areas, forest areas, and viewpoints have separate identities)
-  Social Focus
-  Economic Focus
-  Environmental, Social, and Economic Focus

APPENDIX E: ORGANIZATIONAL RESOURCE LIST

I have gathered this list to supplement the research and needs assessment I carried out for my thesis, Sustainable Livelihood Community Level Assessment of Wayand, Kerala in May of 2016 in order to document the existing assets and capacity network of organizations in Wayanad, Kerala. . It documents organizations and resources that aim to promote sustainable livelihoods that could be beneficial to anyone interested in learning more about existing programs and opportunities. This list is meant to be used as a resource to identify potential partnerships, or as a resource for comparing models of development, and finding funding sources for TGGFCT. The majority of the organizations have an agricultural emphasis and are organized by their geographic scope in the following order:

Regional (Wayanad)
State (Kerala)
National (India)
International (Global)

Wayanad

SUSTAINABLE DEVELOPMENT

The Golden Greens Foundation Charitable Trust (TGGFCT)

<http://www.tggfct.org/>

TGGFCT based out of Wayanad, aims to equip the people in rural areas (of India) with skills, resources, and opportunities so that they may self sustain.

Ms. Swaminathan Research Foundation Community Agrobiodiversity Centre (MSSRF):

<http://www.mssrf.org/>

Aims to address pertinent issues of sustainable agriculture rural development through agrobiodiversity.

Profugo

<https://profugo.org/>

United States based non-profit that worked on issues related to Sustainable Agriculture, Health & Wellness, Waste, and Skill Development. They established a [Center of Development](#) in 2010 in Wayanad. The program is built around a group of 40 families who have joined together with Profugo with a vision to build a healthy and economically viable community.

RASTA

www.rastaindia.org

RASTA pursues a comprehensive approach to rural development and the empowerment of marginalized people, based out of Wayanad.

Wayanad.net & Wayanad Co.

<http://www.wayanad.net/index.html> Website dedicated to promote Wayanad as an eco-tourism destination

<http://shop.wayanad.co.in/> Buy spices and other value-added goods directly from Wayanad farmers, managed by Wayanad.net.

Golden Greens Consulting Firm

<http://www.thegoldengreens.com/>

A sustainable rural development Consulting Group with significant expertise in developing & managing responsible tourism projects in remote area.

AGRICULTURAL

Organic Wayanad/Vanamoolika:

<http://www.vanamoolika.org/>

Vanamoolika: Conservation and organic cultivation of medicinal plants and production of organic ayurvedic medicines.

Organic Wayanad: Organization dedicated to socio-economic development of small and marginal farmer communities of Wayanad.

Krishi Vigyan Kendra (KVK): conducts training programmes, frontline demonstrations, participatory action research programmes based out of Kerala Agricultural University.

Regional Agricultural Research Station (RARS)

<http://www.kau.in/institution/regional-agricultural-research-station-ambalavayal>

Research Station of Kerala Agricultural University, responsible for the generation and transfer of technology related to rice and rice based cropping systems, pulses, vegetables, organic farming and seed technology.

Wayanad Small Scale Tea Growers Association (WSSTGA)

<http://www.thehindu.com/news/national/kerala/tea-growers-in-wayanad-on-a-sticky-wicket/article7741316.ece>

Highland Farmers' Cooperative Society (Hicos) to take on the economic and ecological challenges of conversion from chemical-to-organic farming. Nearly 500 ha of contiguous smallholdings in this village already spot sign boards showing 'Organic Farming Zone'.

<http://www.wayanadtravel.com/eco-tour/organic-farming/>

Sunday Farming

<https://www.facebook.com/Sundayfarming-280292222120746/?fref=ts>

Founded by Professor Jabbar of KVK, Sunday farming is a developmental strategy to foster nutrition centered farming system by creating a shared resource group of low cost farming strategies and tools.

Wayanad Milk

<http://www.wayanadmilk.com/profile.html>

Wayanad Milk is an initiative of Sulthan Bathery Co-operative Milk Supply Society Ltd. established in the year 1963, with 56 members, now it has around 7000 members. Making it Kerala's largest primary milk co-operative society.

Uravu Bamboo

<http://www.uravu.net/>

<http://www.uravubamboogrove.com/>

Uravu is a non-government organization working with people, governments and businesses to implement programs for sustainable employment and income generation in rural areas. Uravu bamboo grove is both an eco-tourist site as well as a craft center providing ethical and eco-friendly jobs to locals and crafts for sale to the community.

Bio DIVA

<http://www.uni-passau.de/en/biodiva/home/>

BioDIVA conducts inter- and transdisciplinary research on land-use change and agrobiodiversity in South India with a particular focus on Wayanad.

TRIBAL SPECIFIC

Peep Wayanad

<http://peepwayanad.org/index.html>

PEEP is an NGO, which has been working for the last five years among the Paniya tribe who are settled in Wayanad, Malappuram, Kannur and Kozhikkode districts of Kerala, they are dedicated to transform the living conditions of the Paniya people through facilitating their social, economic and educational empowerment.

Wayanad Girijana Seva Trust

<http://www.wgstrust.org.in/>

A charitable organization registered in the year 2002 with prime and ultimate objective of contributing the process of education with focus on Re-schooling the school drop-outs among the children from the impoverished Tribal (Aboriginal) communities across Wayanad District one of the most backward District in Kerala State.

Tudi

Wayanadtudi.org

TUDI is a socio-cultural movement of the tribals (Indigenous people of India) in Wayanad District, Kerala in Eachome, a remote village in Panamaram Panchayath in the year 1996 under the leadership of Kerala Jesuit Society. TUDI has been implementing, various activities keeping links with other tribal sphere of Kerala and India.

WELFARE/SOCIAL SERVICES

Shreyas Social Service Centre: The official social development organization of the Malankara Catholic Diocese of Bathery to uplift the poor and marginalized. It is one of the leading NGOs working in South India for the development of Marginal Farmers, Tribal, Women, Children and Senior Citizens, started in 1979 and registered since 1986.

Wayanad Social Service Society

<http://www.wsssindia.com/>

WSSS aims to promote socio-economic empowerment targeted towards tribals, women, small and marginal farmers through participatory development interventions. 566 certified organic farmers involved with this organization.

Aksheya: Women's Welfare Association

Limited information available online.

Christian societal welfare organization helping to serve the needs of women, tribals, and the agricultural community of Wayanad.

Wayanad Muslim Orphanage

www.wmomuttil.org

An orphanage serving the Wayanad community.

GOVERNMENTAL

Tribal Development Office

Government office responsible for all tribal communities within the Wayanad District.

Experimental projects managed by the Government for the rehabilitation of tribals:

Sughandagiri Cardamom Project (Vythiri)

Priyadarsini Tea Estates (Mananthavady)

Kerala Specific

GOVERNMENTAL

Kerala Planning Board

<http://www.spb.kerala.gov.in/>

People's Campaign for Planning

Jalanidhi

<http://www.jalanidhi.kerala.gov.in/>

Project of Government of Kerala and the World Bank to supply clean and adequate drinking water to rural poor and ensure resource and operational sustainability.

Karshika Kerala: Department of Agricultural Development and Farmers Welfare

<http://www.keralaagriculture.gov.in/index.asp>

Maintains information about crops, irrigation, and soil conditions in Kerala.

Kerala Scheduled Tribe Development Department

<http://www.stdd.kerala.gov.in/index.html>

The Scheduled Tribes (STs) are the groupings of historically disadvantaged people that are given express recognition in the Constitution of India. The reservation policy became an integral part of the Constitution through the efforts of Dr. Bhimrao Ambedkar, father of Modern India and architect of the Indian Constitution; he participated in Round Table Conferences and fought for the rights of the Oppressed and Depressed Classes. The Constitution lays down general principles for the policy of affirmative action for the Scheduled Tribes.

Kerala Rural Water Supply and Sanitation Agency

<http://www.jalanidhi.kerala.gov.in/>

Oversees the Jalanidhi projects within the state. The major objective of the organisation is the sustained provision of adequate quantities of safe, drinking water to the rural poor, the focus on ensuring sustainability of source, sustainability of operations, adequacy of water and quality of water are equally important and are designed into components within the project design.

Akshaya

<http://www.akshaya.kerala.gov.in/index.php/home>

A Kerala government project whose prime objective is to provide ICT accessibility and services to the reach of the common man and, thus, to bridge the gap between the “Information Rich and the Information Poor” – Akshaya project was conceived in such a way as to achieve this objective by developing ICT access points (e-centres) primarily.

Kerala State Backward Class Development Corporation (KSBCDC)

<http://ksbcd.com/admin.html>

KSBCDC is a company fully owned by the Government of Kerala that implements their schemes by providing financial loan assistance to the members of Backward and Minority Communities.

Kudumbashree

<http://www.kudumbashree.org/?q=home>

Launched by the Government of Kerala in 1998 to eradicate absolute poverty through action under the leadership of Local Self Governments and women-empowerment projects. The programme has 41 lakh members and covers more than 50% of the households in Kerala.

Centre for Development Studies

<http://www.cds.edu>

University program in Kerala offering master and PhD programs with a research focus on economic and social development.

Kerala Agricultural University (KAU)

<http://www.kau.in/>

The primary instrument of the Kerala state in providing human resources, skills and technology required for the sustainable development of its agriculture, defined broadly encompassing all production activities based on land and water, including crop production (agriculture) and forestry through conducting, interfacing and integrating education, research, and extension in these spheres of economic endeavour. KAU operates 23 research institutions, 2 educational and 21 research focused, which are administered by the Departments of Agriculture and Animal Husbandry of the Government of Kerala.

Kerala People's Science Movement Kerala Sastra Sahitya Parishad, (KSSP)

<http://www.kssp.in/>

Has promoted environmental protection for the past 25 years. Their most significant programs are "group farming" and the "people's resource mapping program".

NGO's

Western Ghats (Wapco)

<http://www.westernghat.org/index1.php>

Western Ghats Agricultural Products Processing Pvt. Ltd. (Wapco) is a farmer company set up during 2008 for conducting higher value addition of coffee and spices to reach and deliver to consumers. The company is set up with an invest the promoters namely SHZW Netherlands, FFT India, AOFG India and Fair Trade Farmer Association of Chelambra (an apex body of Three Farmers Associations from Adimali, Kumily and Wayanad).

Wapco links Farmer Companies of small and marginal farmers of Western Ghats work for the value addition of Farmer's produces; Coffee, Spices and Fruits, and market the produces for better economic returns.

Fair Trade Alliance Kerala

<http://ftak.in/site/index.php>

Organic Advices

<http://www.organicadvices.com/>

A Kerala based web portal dedicated to sharing organic methods and practices. that publishes articles and videos related with organic farming, cultivation tips and methods from here.

Jaiva Keralam (Organic Kerala)

<http://jaivajeevitham.blogspot.in/>

Organic Sustainability of Kerala.

India At Large

GOVERNMENTAL

National Commission for Backward Classes

<http://ncbc.nic.in/Home.aspx>

Ministry of Social Justice and Empowerment

<http://socialjustice.nic.in>

Oversees all affairs related to Scheduled Tribes, Scheduled Castes, and Other Backward Classes as well as persons with disabilities in India.

Ministry of Tribal Affairs

<http://tribal.nic.in/>

Set up in 1999 after the bifurcation of Ministry of Social Justice and Empowerment with the objective of providing more focused approach on the integrated socio-economic development of the Scheduled Tribes (STs).

National Institute for Rural Development

<http://www.nird.org.in>

Dedicated to the improvement of economic and social well-being of people in rural areas on a sustainable basis with focus on the rural poor and the other disadvantaged groups through research, action, and consultancy.

Mudra Bank: Micro Units Development & Refinance Agency (Mudra)

<http://www.mudra.org.in/>

Provides loans and start up funds by supporting and promoting partner institutions and creating an ecosystem of growth for micro enterprises sector.

National Bank for Agriculture and Rural Development (NABARD)

<https://www.nabard.org/english/home.aspx>

Promotes sustainable and equitable agriculture and rural prosperity through effective credit support, related services, institution development and other innovative initiatives.

Backward Regions Grant Fund (BRGF)

<http://panchayat.nic.in/brgf/>

The Backward Regions Grant Fund is designed to redress regional imbalances in development. The fund will provide financial resources for supplementing and converging existing developmental inflows into 250 identified districts, so as to:

1. Bridge critical gaps in local infrastructure and other development requirements that are not being adequately met through existing inflows.
2. Strengthen, to this end Panchayat and Municipality level governance with more appropriate capacity building, to facilitate participatory planning, decision making, implementation and monitoring, to reflect local felt needs,
3. Provide professional support to local bodies for planning, implementation and monitoring their plans

ORGANIZATIONS

Society for Elimination of Poverty

<http://www.serp.ap.gov.in/SHGAP/>

Has loans for small farmers to create businesses for preparing/selling botanical pesticide extracts. —> Community Managed Sustainable Agriculture & Non-Pesticidal Management using neem, garlic and chillies for home-made pest control potions (success in Andhra Pradesh)

SECURE (Socio-Economic and Cultural Upliftment in Rural Environment)

<http://www.securengo.org>

An organisation of social workers committed to the cause of the marginalised & vulnerable sections of the society, particularly youth and tribals, based out of Andhra Pradesh.

Navdanya

<http://www.navdanya.org/home>

Navdanya is a network of seed keepers and [organic](#) producers spread across 18 states in India.

Centre for Sustainable Agriculture (CSA)

<http://csa-india.org/topics/events/conferences/>

An organization based out of Hyderabad, India engaged in establishing models of sustainable agriculture working in partnership with NGOs and Community Based Organizations by scaling up the successes and engaging with the establishment for a policy change. The organization

evolved from the sustainable agriculture desk of Centre for World Solidarity (www.cwsy.org) in 1998.

Deccan Development Society (DDS)

<http://ddsindia.com/>

Deccan Development Society (DDS), is a two and half decade old grassroots organisation working in about 75 villages with women's Sanghams (voluntary village level associations of the poor) in Medak District of Andhra Pradesh. The 5000 women members of the Society represent the poorest of the poor in their village communities. Most of them are dalits, the lowest group in the Indian social hierarchy.

India's Amul Dairy Cooperative

<http://www.amuldairy.com>

India's Pulses and Grains Association

<http://www.ipga.co.in>

Pulses, also known as grain legumes, are a group of 12 crops that includes dry beans, dry peas, chickpeas, and lentils. They are high in protein, fibre, and various vitamins, provide amino acids, and are hearty crops. Pulse crops are one of the most sustainable crops a farmer can grow. It takes just 43 gallons of water to produce one pound of pulses, compared with 216 for soybeans and 368 for peanuts.

Confederation of Indian Small Tea Growers Association (CISTA)

<http://www.cista-india.net/>

CISTA aims to convey common issues and suggestions of the Small Tea Growers across the country to the Government for policy intervention. They also work to facilitate and conduct campaigns, orientation, awareness programmes, workshops, collective learning and seminars for the benefit of tea growers and in furtherance of the objectives of the Confederation.

Agriculture and Organic Farming Group (AOFG) India

<http://www.aofgindia.com>

<http://www.westernghat.org/reports/AR-2011.pdf>

NGO (Registered Public Charitable Trust U/s. Act 1882) Working in the rain fed and hill slope farming areas of India since 2001. AOFG India started with a network of 35 NGOs geographically spread over North East India, Andhra Pradesh, Maharashtra, Uttarakhand, Himachal Pradesh and Kerala and continues to support them in project development and implementation. The focused program is to benefit the rural communities in capacity building, human resources development and organic agriculture in rural development, crop value addition, marketing and income generation. Technical training and its application have taken centre stage in all the promotional activity.

Landesa: Rural Development Society

<http://www.landesa.org/what-we-do/india/>

Landesa has partnered with governments, communities and other stakeholders in more than 50 countries to advance pro-poor, gender-sensitive land rights reforms using law and policy tools. These reforms have helped alleviate poverty, reduce hunger and ease conflict over land for more than 150 million poor women and men. In India 680,000 families are now landowners due to their efforts.

PACE Universal

<http://paceuniversal.org/our-schools/>

PACE is committed to ending trafficking and uplifting communities through the education of girls and women living in extreme poverty. School is based in Kolkata, India.

WWOOF India

<http://www.woofindia.org/>

Links volunteers interested in organic farming to organic farms in India. Volunteers work in exchange for accommodation and food.

International

GOVERNMENTAL

United Nations Development Program (UNDP)

<http://www.undp.org/>

UNDP works in nearly 170 countries and territories, helping to achieve the eradication of poverty, and the reduction of inequalities and exclusion. We help countries to develop policies, leadership skills, partnering abilities, institutional capabilities and build resilience in order to sustain development results.

Food and Agricultural Organization (FAO)

<http://www.fao.org/home/en/>

FAO's three main goals are: the eradication of hunger, food insecurity and malnutrition; the elimination of poverty and the driving forward of economic and social progress for all; and, the sustainable management and utilization of natural resources, including land, water, air, climate and genetic resources for the benefit of present and future generations.

World Bank

<http://www.worldbank.org/>

Offers loans, advice, and an array of customized resources to more than 100 developing countries in order to end extreme poverty within a generation and boost shared prosperity.

NGO's

Small Planet Institute

<http://smallplanet.org/about/>

Seeks to identify the core, often unspoken, assumptions and forces — economic, political, and psychological — now taking our planet in a direction that as individuals none of us would choose and support grassroots democracy movements worldwide addressing the causes of hunger and poverty.

International Center for Research on Women (Dr. Mehra)

<http://www.icrw.org/>

ICRW mission is to empower women, advance gender equality and fight poverty in the developing world by working with partners to conduct empirical research, build capacity and advocate for evidence-based, practical ways to change policies and programs.

FARM HACK (International)

<http://farmhack.org/wiki/>

Worldwide community of farmers that build and modify their own tools. It is an online sharing resource of tools, tips, and hacks for the farming community

Consultative Group for International Agricultural Research (CGIAR)

<http://www.cgiar.org/>

CGIAR aims to reduce poverty, improve food and nutrition security and improve natural resources and ecosystem services.

WWOOF

<http://www.woof.net/>

Links volunteers interested in organic farming to organic farms throughout the world. Volunteers work in exchange for accommodation and food.

Food Tank

<http://foodtank.com/>

Food Tank is focused on building a global community for safe, healthy, nourished eaters. We spotlight environmentally, socially, and economically sustainable ways of alleviating hunger, obesity, and poverty and create networks of people, organizations, and content to push for food system change.

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